XCELERATE TRAINING INSTITUTE

your learning & development partner

CONSTRUCTION MANAGEMENT & CIVIL ENGINEERING

Reinforced Concrete Design, Detailing and Works

DURATION	LANGUAGE	FORMAT
5 days	**English**	**Classroom / Online**

Upcoming dates

Dates	Venue	Format	Fee
22 – 26 Feb 2027	Live online	Online (live)	**€1,200**
2 – 6 Aug 2027	Live online	Online (live)	**€1,200**
6 – 10 Sep 2027	Bahrain	Classroom	**€4,800**

Register or ask a question

Online: x8ti.com/course/reinforced-concrete-design-detailing-and-works/

+491631686678 · info@x8ti.com

Reinforced Concrete Design, Detailing and Works

Introduction

Introduction

Concrete is among the most crucial and highly used building materials with a permanent part in all the building structures. It might be considered this important because of its versatility, i.e., the ability to be formless and shapeless when fresh while taking the molded structure of any shape according to requirements for different structural forms. With correct specifications in place and following the right procedures, it is also fire resistant. Concrete can be used in numerous building structures, from single-story buildings to multi-story buildings, retaining structures, containment of bridges, etc.

This Xcelerate Training Institute course will give participants the required skills to effectively and correctly use such an important material in most buildings and structures.

The details covered in this training are the main items that are widely used in the concrete and construction industry, and therefore, there is a great need to understand the design of specially reinforced concrete.

This Xcelerate Training Institute course will highlight the following:

- The importance of earthquake analysis
- Structural elements and various utilized frames
- Case studies where there was the correct use of reinforced concrete
- Section design for moments
- Failures and durability comparison of concrete
- Limit state design
- Structural analysis of concrete structures
- Torsion, shear, and bonds
- Yield lines
- Columns
- Detailing and principal dimensions of structures
- Design standards

Learning Objectives

The main objectives of this training course will be to:

- Equip the participants with the capabilities that are required to design different concrete structures while ensuring quality
- Understand deeply how to design special concrete structures
- Have a thorough and professional understanding of how detailing works
- Provide enhanced tools and techniques that can be used in reinforced concrete designs
- Teach participants various methods of keeping structures in well and better conditions against external

forces
- Teach participants various methods of solving a range of challenges when it comes to reinforced concrete and detailing works
- Give the participants an understanding of control thickness as applied to the concrete
- Provide a basis for simulation and modelling capabilities and skills

Training Methodology

Xcelerate Training Institute Talent has customized all its courses to ensure that the delivery and content will satisfy the audience. Industry best professionals with vast experience will deliver all the contents of this course through lectures, notes, audio-visual presentations, and case studies. Participants are highly encouraged to positively and actively be engaging through presentations and exercises.

Like all our acclaimed courses, this program also follows the ‘Do-Review-Learn-Apply’ model.

Benefits For Your Organization

Organizations that will have professionals who have undergone this course stand to benefit in the following ways:

- Better reinforced concrete designs with low risks
- A structured approach to designing concrete structures and detailing
- Greater investments and higher profits because of reduced risks
- Experience and well-trained professionals to manage and ensure successful completion of concrete projects
- Increased organizational growth because of the alignment of quality project deliverables
- Continuous and regular training of other professionals for concrete design projects
- Reduced engineering costs because of improved skills by professionals to self-design
- Optimized results because of advanced skills

Benefits For You

Professionals who will be taking this course shall gain in the following ways

- Enhanced analytical skills to devise and design concrete structure plans
- Increased confidence and knowledge to effectively design concrete structures
- Improved awareness and exposure to conduct a thorough risk analysis on any concrete designs
- Deep understanding of design and analysis of special concrete designs
- Quick recognition of design requirements

Target Audience

- Construction contractors
- Civil and structural engineers
- Client organizations
- Managers that want to have a hands-on understanding of concrete design
- Any other professionals who aspire to build quality concrete structures

Course Outline

Introduction

- Introduction to detailing
- Structural elements and frames
- International design standards
- Reinforced concrete structures
- Calculations, computing, and other design aids
- Structural designs

Slabs and Beams

- Horizontal shear transfer
- Truss models
- Strip method
- Strut-and-Tie model
- Bearing and shear walls
- Design of shear walls
- Shear friction
- Corbels
- Deep beams

Durability and Structural Failures

- Structures that use reinforced concrete
- Various concrete components
- Concrete mix design
- Cement usage
- Admixtures
- Aggregates
- Test performed on wet concrete
- Work ability tests
- Work ability measures
- Reinforcement
- Properties of concrete
- Creep
- Tensile strength of concrete
- Shrinkage
- Compressive strength
- Modulus of elasticity
- Different failures in concrete structures
- Chemical attack
- Incorrect materials selection

- Application of poor construction methods
- Factors affecting failure
- Design errors and miscalculations
- External physical
- Concrete cover
- Cover as fire protection
- The durability of concrete analysis

Programs Used in Reinforced Concrete Design

- Program section design
- Sample runs
- Program source listings
- Beam deflection programs
- Column analysis programs
- Column design
- RC beam program

Pr-Stressed Concrete Design

- Deflections
- Stress calculations
- Pr-stress losses
- Design of shear reinforcement
- Materials used for prepossessed concrete
- Shapes of prepossessed sections
- Pr-tension and post-tension

Torsion, Shear, and Bond

- Torsion
- Torsional reinforcement
- Occurrence and analysis
- Torsional shear stress in the concrete section
- Torsion structural analysis
- Shear
- Shear reinforcement in beams
- Shear due to much loads concentration
- Shear in a homogeneous beam
- Shear resistance of solid slabs
- Bond, laps, and bend stress bearing
- Local bond
- Laps and joints
- Anchorage bond
- Hooks and bends

- Bearing stresses inside bends

Cracks and Deflection

- Deflection
- Calculations in deflection
- Span-to-effective depth ratio
- Checks and the limit points of deflection
- Cracks
- Cracks width and their calculations
- Controls and limits in cracking
- Bar space handling and controls

Re informed Concrete Framed Structures

- Structural actions and their types
- Robustness and tie design
- Internal ties
- Types of ties
- Vertical ties
- Horizontal ties to walls and columns
- Design of ties
- Corner column ties
- Building loads
- Load combinations
- Dead load
- Imposed loads
- Wind loads
- Frame analysis: different methods of analysis
- Design examples

Retaining and Detailing

- Counter fort retaining walls
- Design of cantilever walls
- Stability and design procedure
- Design procedure for cantilever walls
- Types and earth pressure
- Types of detailing and retaining walls
- Earth pressure on retaining walls

Columns

- Types, classification, limits of loads, and design considerations
- Practical design provisions
- General provision code
- Types of loads

- Short columns which can handle the axial load and bending UN symmetrical reinforcement
- Design charts
- Design methods
- Approximate method
- General design method
- Short braced columns with axial loads
- Expressions for the code design
- Effective heights of columns
- Slenderness limit for columns
- Effective height of any column
- Unbranded and braced columns
- Additional moments due to deflections
- Unbranded structures
- Failure surface method

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Registration Form

Reinforced Concrete Design, Detailing and Works

Preferred dates: ..... Venue or online: .....

Duration: 5 days Language: .....

Please complete and email this form to us, or register online. We confirm your place and send the invoice within one working day.

Delegate information

Full name (Mr / Ms / Dr / Eng): .....

Position: ..... Telephone / mobile: .....

Official email: ..... Personal email: .....

Company information

Company name: .....

Address: .....

City / country: ..... VAT / tax number: .....

Person responsible for training & development

Full name (Mr / Ms / Dr / Eng): .....

Position: ..... Telephone / mobile: .....

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Payment

☐ Please invoice me ☐ Please invoice my company

Signature: ..... Date: .....

Call
+491631686678

Email this form
info@x8ti.com

Register online
Open the course page