



المركز العالمي للتدريب والتطوير
International Centre For Training & Development



CC094

Designing High Performance Concrete Structures



International Association
for Health and Occupational Safety
and the Environment



Course Introduction:

This course will introduce you to state-of-the-art technologies and methodologies for designing and specifying concrete subjected to extreme conditions.

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- Understand the basics of quality concrete construction
- Provide design details to minimize concrete deterioration
- Develop project specifications to improve concrete durability
- Utilize the latest technology in concrete materials and construction methods
- Reduce potential conflicts in specifications
- Understand quality assurance methods for concrete
- Recognize and solve potential problems with concrete construction

Who Should Attend?

This course is intended for engineers who design concrete structures exposed to harsh environments such as bridges, roadways, plazas, parking structures, marine structures or any building with exposed concrete. Nearly every structure has one or more components that are potentially subjected to a harsh environment including freeze-thaw and chemical attack. Engineers must have a good understanding of these failure mechanisms to provide effective design solutions. Contractors and product suppliers will also benefit from this seminar.

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Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Outline:

Day 1:

Concrete in Extreme Conditions

- Freeze-Thaw
- Chemical Attack
- Marine Environments
- Abrasion and Erosion
- High Strength Concrete
- Self-Consolidating Concrete
- Mass Concrete
- Roller-compacted Concrete
- Pervious Concrete
- Ultra-thin White topping

Design Details to Reduce Corrosion

- Crack Control
- Concrete Cover
- Materials and Mix Design

Day 2:

Characteristics

- Membranes and sealers
- Cathodic Protection

Fundamentals of Quality Concrete

- Materials
- Batching and Delivery
- Quality Control and Quality Assurance

Day 3:

Construction Methods

- Handling and Placing Concrete
- Finishing and Curing Concrete
- Hot and Cold Weather Concrete
- Construction Scheduling

Specifying Concrete for High Performance

- Prescriptive versus

Day 4:

Performance-based Specifications

- Performance Criteria
- Construction Execution
- Pre-qualification Testing
- Acceptance Testing

Day 5:

Troubleshooting Concrete Failures

- Plastic Concrete
- Hardened Concrete

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Fees:

To be advised as per the course location. This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session