CONCEPT

Concrete Technology and Mix Design: Admixtures, Hot-Weather Pours and Site QC

7 – 11 November 2027
Dammam - Eastern Province five-star



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Ref: 258_15404 **Date:** 7 – 11 November 2027 **Location:** Dammam - Eastern Province five-star **Fees:** 19500 SAR

Introduction:

Rejected truckloads, low cube results, plastic shrinkage cracks and hot pours that set in the pump line cost new-build projects time and money long before handover. This Core Concept course builds concrete technology and mix design practice for materials and site teams: selecting cements, supplementary cementitious materials, aggregates and admixtures, proportioning and trialling mixes, placing and curing in hot weather, testing fresh and hardened concrete and controlling ready-mix supply and large pours. Participants produce a Concrete Mix Submittal and Pour Quality Control Plan for a mix grade from their own project.

Course Objectives:

- Select cement types, fly ash, slag, silica fume, aggregates and chemical admixtures to meet strength, workability and exposure requirements in a concrete specification
- Proportion normal, high-performance and self-compacting mixes using the ACI 211.1 absolute volume method and adjust them from trial batch results
- Plan hot-weather placing and curing to ACI 305 and ACI 308, including concrete temperature limits, retarders, cooling methods and evaporation control
- Run and interpret slump, slump-flow, temperature, air content and compressive strength tests and apply acceptance criteria to delivered batches
- Control ready-mix supply, batching records and pour sequencing, and limit temperature differentials in mass concrete pours to ACI 207 guidance
- Prepare a Concrete Mix Submittal and Pour Quality Control Plan for a specified mix grade

Target Audience:

- Materials and laboratory specialists who prepare mix submittals, run trial batches and test concrete samples
- Quality control specialists who sample, test and accept or reject fresh concrete at the point of delivery
- Site specialists who plan pours, placing crews, finishing and curing on new-build projects
- Ready-mix plant specialists responsible for batching accuracy, material stockpiles and truck dispatch
- Consultant supervision specialists who review mix submittals and witness trial mixes and pours

Course Outline:

Day 1: Concrete Ingredients: Cements, Supplementary Cementitious Materials and Aggregates

- Portland Cement Types, Clinker Phases and Heat of Hydration Behaviour
- Fly Ash Classes to ASTM C618 and Cement Replacement Levels by Mass
- Ground Granulated Blast Furnace Slag and Silica Fume Pozzolanic Reaction
- Coarse and Fine Aggregate Grading Curves, Particle Shape and Moisture Condition
- Mixing Water Quality and Material Certificate Review for a Supply Chain

Day 2: Admixtures, Specification Language and Mix Proportioning Method

- Water Reducers, Superplasticizers, Retarders, Accelerators and Air Entraining Agents
- Admixture Compatibility Trials and Dosage Response Curves
- ACI 301 Specification Clauses: Strength Class, Exposure Category and Maximum Water-Cement Ratio
- ACI 211.1 Absolute Volume Proportioning: Water Demand, Cement Content and Aggregate Volume
- Design Mix Versus Nominal Mix and Target Mean Strength Margins

Day 3: Trial Batches, Special Mixes and Fresh Concrete Testing

- Laboratory Trial Batch Procedure and Batch Weight Corrections for Aggregate Moisture
- High-Performance Concrete Proportioning with Silica Fume and Low Binder Water Content
- Self-Compacting Concrete Slump-Flow, Passing Ability and Segregation Resistance Trials
- Slump Testing to ASTM C143 and EN 12350-2, Air Content and Fresh Density Checks
- Specimen Making, Initial Curing and Compressive Strength Test Records

Day 4: Hot-Weather Concreting, Curing, Mass Pours and Nonconformance Control

- ACI 305 Hot-Weather Measures: Concrete Temperature Limits, Chilled Water and Ice Replacement
- Evaporation Rate Control, Windbreaks and Plastic Shrinkage Crack Prevention
- ACI 308 Curing Methods: Wet Curing, Curing Compounds and Curing Blankets
- ACI 207 Mass Concrete Heat of Hydration, Temperature Differential Limits and Cooling Pipes
- Low Strength Results, Rejected Loads and Nonconformance Report Handling

Day 5: Mix Submittal Build and Pour Quality Control Plan

- Case Brief: Podium Raft Pour and High-Strength Column Mix on a Mixed-Use Project
- Mix Proportioning Spreadsheet Build and Trial Batch Adjustment for the Case Grades
- Ready-Mix Delivery Ticket Checks, Truck Scheduling and Batching Record Audit
- Pour Quality Control Plan: Sampling Frequency, Hold Points and Thermal Monitoring Layout
- Concrete Mix Submittal Presentation to a Consultant Review Panel

Skills You Will Gain:

- Cementitious Material Selection
- Aggregate Grading Evaluation
- Admixture Dosage Control
- Absolute Volume Mix Proportioning
- Fresh Concrete Sampling and Testing
- Hot-Weather Placing Control
- Mass Pour Thermal Control
- Ready-Mix Supply Auditing

Why Attend This Course:

- Return with a Concrete Mix Submittal and Pour Quality Control Plan for a mix grade on your own project
- Cut rejected loads and low strength results by setting clear delivery, sampling and acceptance rules before the first pour
- Handle summer pours with practical temperature, retarder and curing measures that site crews can follow
- Compare mix and site practice with specialists from building, infrastructure, industrial and ready-mix supply backgrounds

Conclusion:

Consistent concrete quality on new-build work depends on decisions taken long before the pump arrives: the binder, the aggregates, the admixtures, the trial batches and the rules for accepting each load. The course moves from ingredients and specification language through proportioning, trial batches and testing to hot-weather placing, curing and mass pours. The final day turns this into a Concrete Mix Submittal and Pour Quality Control Plan ready for consultant review.