CONCEPT

Industrial Building Design: Control Buildings, Substations, Warehouses and Workshops

11 – 15 October 2027
Barcelona - Eixample district four-star



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Ref: 938_21566 **Date:** 11 – 15 October 2027 **Location:** Barcelona - Eixample district four-star **Fees:** 23500 SAR

Introduction:

Industrial building design on oil, gas, power and manufacturing sites is often treated as an afterthought to process engineering, so control buildings overheat, substation cable rooms flood, warehouse roofs leak in sandstorms and workshops lack safe egress. This Core Concept course gives civil, architectural and building services engineers a structured method to classify non-process buildings, place them on the plot, select structural and envelope systems, coordinate HVAC, pressurisation, cable routes and fire safety, and plan for maintenance. Participants produce a Design Basis and Layout Package for a case substation and control building.

Course Objectives:

- Define the design basis, room data sheets and climate inputs for control, substation, warehouse, workshop, office and gatehouse buildings
- Position non-process buildings on the plot plan against hazardous area boundaries, separation distances, prevailing wind and access roads
- Select pre-engineered steel, concrete or masonry structural systems and an envelope and roofing system suited to heat, dust and corrosion
- Specify HVAC, room pressurisation, cable cellars, raised access floors and trenches for control and electrical rooms
- Plan fire detection and suppression, means of egress and accessible routes for occupied industrial buildings
- Coordinate building services and maintenance access so equipment can be installed, replaced and serviced over the building life

Target Audience:

- Civil engineers who lay out and specify non-process buildings on plant and utility sites
- Architectural engineers who plan room layouts, envelopes and escape routes for industrial buildings
- Building services engineers who design HVAC, pressurisation and fire systems for control and electrical rooms
- Electrical interface engineers who define switchgear, cable and battery room needs for building designers
- Owner's project engineers who review contractor building designs on oil, gas, power and manufacturing projects

Course Outline:

Day 1: Non-Process Building Types, Functions and Design Inputs

- Non-Process Building Register: Control, Substation, Warehouse, Workshop, Office and Gatehouse Functions
- Building Design Basis Document Structure: Occupancy, Equipment, Loads and Design Life
- Room Data Sheets for Switchgear, Battery, Relay, Telecom and Operator Rooms
- Site Climate Data Review: Ambient Temperature, Dust, Humidity and Corrosive Atmosphere
- Brownfield Building Condition Walkdown Checklist

Day 2: Plot Layout, Structural Systems and Envelope Selection

- Plot Plan Zoning: Hazardous Area Boundaries, Separation Distances and Prevailing Wind
- Substation Plot Arrangement: Transformer Bays, Earthing Grid, Security Fencing and GIS Versus AIS Footprint
- Pre-Engineered Steel Buildings: Tapered Portal Frames, Purlins, Girts and Bay Spacing Selection
- Cast-in-Place Concrete, Precast Panel and Concrete Masonry Unit Options Compared
- Roof and Wall Cladding: Insulated Sandwich Panels, Standing Seam Roofing and Dust Sealing

Day 3: Building Services, Cable Management and Fire Protection

- HVAC Load Estimate for Control and Electrical Rooms: Equipment Heat Dissipation and Solar Gain
- Room Pressurisation to IEC 60079-13: Clean Air Intake, Airlock Lobbies and Loss-of-Pressure Alarms
- Cable Entry Arrangements: Cable Cellar, Raised Access Floor Void Height and Tile Load Ratings
- Cable Trench, Duct Bank and Fire-Stopped Wall Penetration Details
- Fire Detection and Gaseous or Water-Based Suppression Selection for Switchgear and Battery Rooms

Day 4: Egress, Coordination Clashes and Maintainability Risks

- Means of Egress Layout: Travel Distance, Exit Width, Dead-End Corridors and Emergency Lighting
- Accessible Routes, Ramps and Welfare Facilities in Industrial Offices and Gatehouses
- Multidiscipline Clash Review in 3D Models: Ducts, Cable Trays, Steelwork and Ceiling Voids
- Equipment Replacement Paths: Door Sizes, Removable Panels, Lifting Beams and Crane Access
- Failure Cases: Condensation, Roof Ponding, Battery Room Hydrogen Build-Up and Water Ingress

Day 5: Case Substation and Control Building Design Basis

- Case Data Pack: Single-Line Diagram, Equipment List, Plot Plan Extract and Climate Data
- Case Room Layout: Switchgear, Relay, Battery, Telecom and Operator Rooms Over a Cable Floor
- Case Structural and Envelope Selection with HVAC and Pressurisation Concept
- Case Fire, Egress and Maintenance Access Plan Marked on the Building Layout
- Design Basis and Layout Package Presentation and Peer Challenge

Skills You Will Gain:

- Building Design Basis Preparation
- Plot Plan Building Placement
- Pre-Engineered Building Selection
- Hot-Climate Envelope Specification
- Electrical Room HVAC Sizing
- Cable Floor and Trench Detailing
- Industrial Egress Planning
- Maintainability Review

Why Attend This Course:

- Leave with a Design Basis and Layout Package for a case substation and control building
- Catch overheating, flooding and blocked replacement routes in building drawings before they reach construction
- Give electrical, HVAC and structural disciplines one set of room data sheets to design against
- Compare building practice with engineers from oil and gas, power, water and manufacturing sites

Conclusion:

Non-process buildings keep a plant running only when layout, structure, envelope, services and safety are designed together. The course moves from building types, design basis and room data sheets, through plot placement, pre-engineered steel, concrete and masonry options and hot-climate envelopes, to HVAC, pressurisation, cable floors, trenches and fire protection, then egress, accessibility, clash review and maintainability. The final day applies the method to a case substation and control building and produces a Design Basis and Layout Package ready for discipline review.