
Structural Systems and Design Review for Project and Asset Leaders Training Course

11 – 15 July 2027
Kuala Lumpur





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Programme Summary

Structural systems and design review is the subject of this five-day training course for project, asset and multidisciplinary engineering leaders at managerial level, ending in a structural design review pack for one building or facility. Decisions on layouts, services and changes are often taken without a clear view of structural behaviour. The approach moves from loads and load paths, through members, materials and foundations, to design basis review, then to a worked pack. Mars Training Centre UK delivers this programme in structural systems and design review.

The Business Case

Late structural changes, unclear load assumptions and poorly coordinated openings and supports cause delay, rework and avoidable safety concerns in service. Leaders who can read structural drawings, question the design basis and judge the effect of a change can raise issues while they are still cheap to resolve, keep delivery on programme, and can brief structural engineers precisely and early.

- Design Change Cost: Falls as structural effects of changes are identified before they are instructed.
- Coordination Clashes: Reduce as supports, openings and service loads are checked against the structural concept.
- Structural Risk Exposure: Improves as assumptions, limits and open items are recorded and ranked consistently.

Principles and Evidence Base

- ISO 2394: Its general principles on reliability for structures frame the treatment of actions, resistance and limit states in Sessions 1 and 3.
- Limit States Design: This recognised approach structures the comparison of strength and serviceability checks in Session 2.
- ISO 31000: Its risk management process guides the ranking of structural risks and change decisions in Sessions 4 and 5.

Intended Participants

- Project leaders who coordinate structural and services design.
- Asset and facility owners who approve alterations to existing structures.
- Mechanical, electrical and process engineers whose equipment places loads on structures.
- Procurement and contract managers who handle structural packages and variations.

The programme serves building, infrastructure, industrial and energy projects.



Learning Outcomes

1. Participants will be able to trace loads from their source through members and foundations to the ground.
2. Participants will be able to evaluate the behaviour of common structural systems in steel, concrete, timber and masonry.
3. Participants will be able to diagnose weaknesses in a design basis and its stated assumptions.
4. Participants will be able to construct review questions for structural drawings and calculation summaries.
5. Participants will be able to prioritise structural risks and open items for decision.
6. Participants will be able to justify a structural design review pack to a project board.

Programme Structure

Day 1: Structural Systems and Design Review Foundations

How do loads travel through a structure to the ground?

- Dead, Live, Wind and Seismic Action Categories
- Load Path Sketch from Roof to Foundation
- Structural Drawing Conventions and Reading Order
- Gravity and Lateral Load Resisting Systems
- Case Review of Two Structural Failures

Day 2: Members, Materials and Foundations

How do beams, columns, slabs and foundations carry load and fail?

- Bending, Shear and Axial Behaviour of Members
- Steel, Concrete, Timber and Masonry Characteristics
- Strength and Serviceability Check Comparison
- Foundation Types and Ground Conditions
- Connection and Detailing Weak Points

Day 3: Design Basis and Assumptions

What must be stated, and what must be challenged, in a design basis?

- Design Basis Statement Structure
- Load Combination and Partial Factor Summary
- Reliability and Limit State Concepts from ISO 2394
- Calculation Summary Review Questions
- Existing Structure Condition and Capacity Assumptions



Day 4: Interfaces, Changes and Risk

How are changes and interfaces judged before they are instructed?

- Equipment Load and Opening Request Form
- Structural Change Impact Screening Matrix
- Interface Register for Structural and Services Design
- ISO 31000 Risk Register for Structural Issues
- Temporary Works and Sequence Considerations

Day 5: Applying Structural Systems and Design Review to a Facility

Is the review pack ready for the project board and the structural engineers?

- Applying the Session 1 Load Path Sketch to the Chosen Facility
- Testing the Session 2 Member Checks on Sample Elements
- Applying the Session 3 Review Questions to the Design Basis
- Ranking the Session 4 Interface and Change Items
- Completing the Structural Design Review Pack

Methodology

The programme is built around case analysis and structured exercises. Participants work with anonymised drawings, design basis extracts and change requests, sketch load paths, frame review questions and rank risks in small teams, then defend their review pack before a simulated project board. No structural calculations are performed, and no software is needed.

- Suggested activity: Tracing the load path of a plant room slab carrying new equipment.
- Suggested activity: Screening a request to cut a large opening in a floor plate.
- Suggested activity: Writing review questions for a foundation design summary.

Capstone Output

Each participant completes a structural design review pack for one building or facility. It contains an annotated load path sketch, a design basis question list, an interface and change register, a ranked risk list and a briefing note. It is used to prepare design review meetings and to screen changes before approval.

Frequently Asked Questions

Is structural systems and design review training suitable for engineers outside structural engineering?

Yes. Structural systems and design review training is set at managerial level and assumes responsibility for projects, assets or equipment.



Which standards does structural systems and design review rest on in this programme?

Structural systems and design review rests on ISO 2394 for reliability of structures, limit states design and ISO 31000 for risk management.

How is the structural systems and design review pack used at work?

You use the structural systems and design review pack to prepare design review meetings, brief structural engineers and screen changes before approval.

How does structural systems and design review differ from structural design calculation training?

Structural systems and design review builds the ability to read, question and coordinate structural design, while calculation training teaches member sizing.