Material Selection, Durability and Life Cycle Cost Training Course for Project Leaders

7 – 11 March 2027
Cairo

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Programme Summary

Material selection, durability and life cycle cost is the subject of this one-week training course for project leaders at managerial level who choose and approve materials and building systems, ending in a material decision file for one live package. Poor material choices rarely fail at the point of purchase; they fail years later, in maintenance bills, early replacement and defects found at handover. The programme moves from performance requirements to service life, cost and environmental comparison, specification and approval, using cases from commercial buildings, housing and infrastructure. Mars Training Centre UK delivers this programme on material selection, durability and life cycle cost to mixed-organisation cohorts.

The Business Case

Decisions on materials and building systems are often taken on first cost and supplier advice, then regretted when a facade, floor or services system needs early repair. Leaders who compare options on service life and whole-life cost can defend a choice to a board, a client or a lender. The programme builds that habit of comparison and applies it to a package from the participant's own project.

- Whole-Life Cost: Falls as options are compared on maintenance and replacement as well as first cost.
- Defect Exposure: Reduces as specifications state tested performance and approval routes.
- Decision Quality: Improves as each choice is recorded with its evidence and assumptions.

Principles and Evidence Base

- ISO 15686 Service Life Planning: Supplies the method for estimating how long a component lasts in its setting, applied in Session 2.
- ISO 14040 Life Cycle Assessment Principles: Frame the environmental comparison of materials, applied in Session 3.
- Time Value of Money: Underpins discounting of future maintenance and replacement costs, applied in Session 3.
- Performance-Based Specification Logic: Defines what a material must achieve rather than what it is called, applied in Session 4.

Intended Participants

- Project leaders who decide between alternative materials and building systems.
- Owner representatives who approve specifications and substitutions on behalf of a client.
- Technical managers who review submittals, samples and test evidence.
- Procurement and commercial staff who compare tenders for materials and systems.
- Asset and facilities managers who inherit maintenance cost from earlier choices.

Typical settings include developers, contractors, public works bodies and engineering consultancies.

Learning Outcomes

1. Participants will be able to construct a performance requirement brief for a material or building system.
2. Participants will be able to compare alternative options by material family and by structure, envelope and services system.
3. Participants will be able to estimate service life for a component and diagnose its likely failure modes.
4. Participants will be able to evaluate options on life cycle cost and environmental impact.
5. Participants will be able to justify a performance specification and an approval route for a chosen material.
6. Participants will be able to prioritise the evidence needed to defend a material decision.

Programme Structure

Day 1: Material Selection: Requirements and Options

What must a material or system achieve, and which options could meet it?

- Performance Requirement Brief
- Material Family Comparison Chart
- Structure, Envelope and Services System Map
- Option Long-List Screen
- Exposure and Use Condition Profile

Day 2: Durability and Service Life

How long will each option last in its setting, and how does it fail?

- ISO 15686 Service Life Planning Method
- Degradation Mechanism Table
- Factor Method Service Life Estimate
- Maintenance Interval Plan
- Failure Mode Review

Day 3: Life Cycle Cost and Environmental Comparison

Which option costs less and carries less impact over the life of the building?

- Life Cycle Cost Model
- Discount Rate Sensitivity Test
- ISO 14040 Life Cycle Assessment Frame
- Embodied Impact Comparison
- Replacement and Disposal Cost Schedule

Day 4: Specification and Approval

How is the chosen material specified, tested and approved?

- Performance Specification Draft
- Test and Evidence Requirement List
- Sample and Mock-Up Approval Route
- Supplier Submission Review
- Substitution Request Rule

Day 5: Material Decision File for One Live Package

Do the earlier tools give one decision that a sponsor can defend?

- Applying the Session 1 Option Long-List Screen
- Testing the Session 2 Service Life Estimate
- Reviewing the Session 3 Life Cycle Cost Model
- Checking the Session 4 Substitution Request Rule
- Completing the Material Decision File

Methodology

The programme uses a structured exercise on one prepared building package with three competing options, exposure data, price information and a draft specification. Participants rank the options, record each assumption in a common format and compare results in small groups, then apply the same tools to a package from their own project.

- Suggested activity: Estimating the service life of two facade options in the same climate.
- Suggested activity: Building a life cycle cost comparison with and without discounting.
- Suggested activity: Rewriting a product-named specification as a performance specification.

Capstone Output

Each participant completes a material decision file for one live package. It holds a performance requirement brief, an option screen, a service life estimate, a life cycle cost comparison, a draft performance specification and an approval route. The file is used at work to brief the project board and to answer questions from clients, lenders and auditors about why a material was chosen.

Frequently Asked Questions

Is material selection training suitable for leaders without an engineering background?

Yes. Material selection is taught through a worked building package with plain explanation. The training assumes experience of construction projects or procurement, but no materials science or design qualification.

Which references does material selection, durability and life cycle cost training rest on?

Material selection, durability and life cycle cost training rests on ISO 15686 for service life planning and ISO 14040 for life cycle assessment, together with discounting and performance-based specification logic.

How is the file from material selection training used at work?

You use the material decision file to brief your project board, defend a choice to a client or lender, and set the evidence required before a material is approved.

How does material selection training differ from construction cost estimating training?

Material selection training compares options on performance, service life and whole-life cost, while construction cost estimating training concentrates on pricing a tender and setting risk allowances.