
Circular Construction and Embodied Carbon: Material Reuse and Design for Disassembly Course

4 – 8 January 2027
Cape town





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Programme Summary

Circular construction and embodied carbon, from material reuse to design for disassembly, is the subject of this five-day training course for real estate, infrastructure and sustainability leaders at advanced level, culminating in a circular construction and carbon roadmap for their portfolio. Materials account for a large part of a project's lifetime carbon, yet most buildings are still designed to be demolished and landfilled. The approach moves from circular principles and carbon measurement, through design and material choices, to procurement, waste control and reporting. Mars Training Centre UK delivers this programme in circular construction and embodied carbon.

The Business Case

Investors, lenders and public clients now ask for evidence of lower embodied carbon and less construction waste, and material costs reward projects that reuse what already exists. Leaders who set circular targets at brief stage, measure carbon consistently and write reuse into contracts can cut material spend and waste charges while meeting the rising expectations of funders, tenants and regulators.

- Embodied Carbon per Square Metre: Falls as low-carbon and reused materials are selected on measured life cycle data.
- Construction and Demolition Waste Sent to Landfill: Reduces as pre-demolition audits and reuse targets direct materials to new uses.
- Asset Adaptability Value: Rises as buildings are designed to be reconfigured or dismantled rather than demolished.

Principles and Evidence Base

- ISO 59004 and ISO 59020: Circular economy principles and the measurement of circularity performance frame the strategy and indicators set in Session 1.
- ISO 14040 and ISO 14044: Life cycle assessment principles and requirements underpin the embodied carbon assessment in Session 2.
- ISO 21930: Environmental product declarations for construction products guide the material comparison work in Session 2.
- ISO 20887: Design for disassembly and adaptability shapes the design review in Session 3.



Intended Participants

- Leaders who set sustainability targets for property or infrastructure portfolios.
- Sustainability heads who report carbon and waste performance to boards and funders.
- Design and construction managers who choose materials and systems.
- Public works leaders who write requirements into tenders and contracts.

The programme serves real estate developers, infrastructure agencies, contractors and design consultancies.

Learning Outcomes

1. Participants will be able to construct circular economy objectives and indicators for a project or portfolio.
2. Participants will be able to evaluate embodied carbon results using life cycle assessment and environmental product declarations.
3. Participants will be able to justify design for disassembly and adaptability choices on cost and carbon.
4. Participants will be able to diagnose reuse potential through pre-demolition audits and material passports.
5. Participants will be able to prioritise circular procurement clauses and waste targets for contracts.

Programme Structure

Day 1: Circular Construction Principles and Strategy

What does a circular approach change in how assets are briefed and valued?

- Circular Economy Principles Under ISO 59004
- Circularity Indicators Using ISO 59020
- Material Flows in Buildings and Infrastructure
- Circular Business Models: Leasing, Take-Back and Reuse
- Setting Circular Objectives at Brief Stage

Day 2: Measuring Embodied Carbon and Whole-Life Carbon

How is carbon measured consistently enough to drive decisions?

- Life Cycle Assessment Stages and System Boundaries
- Embodied Versus Operational Carbon Trade-Offs
- Environmental Product Declarations Under ISO 21930
- Carbon Hotspots: Concrete, Steel, Glass and Finishes
- Carbon Baselines and Reduction Targets



Day 3: Design for Disassembly and Low-Carbon Materials

Which design choices keep materials valuable at the end of first use?

- Design for Disassembly and Adaptability Under ISO 20887
- Demountable Connections and Modular Systems
- Low-Carbon Cement, Timber and Recycled Steel Options
- Secondary Materials and Recycled Aggregates
- Material Passports and Digital Records

Day 4: Reuse, Waste Control and Circular Procurement

How are circular aims written into audits, contracts and site practice?

- Pre-Demolition Audits and Reclaim Inventories
- Construction and Demolition Waste Hierarchy and Targets
- Circular Procurement Clauses and Award Criteria
- Supplier Take-Back Agreements
- Monitoring Waste and Reuse on Site

Day 5: Applying the Circular Construction and Carbon Roadmap

Is the roadmap ready to guide the next projects in the portfolio?

- Applying Day 1 Indicators to a Live Project
- Using Day 2 Carbon Baselines to Set Targets
- Writing Day 4 Clauses Into the Next Tender
- Business Case and Reporting to Boards and Funders
- Completing the Circular Construction and Carbon Roadmap

Methodology

The programme uses case analysis of office, residential, transport and public building projects that have reused structures, cut embodied carbon or recovered materials. Participants compare product declarations, review carbon assessments, examine pre-demolition audits and draft their own tender clauses. Peer review then tests each roadmap for realism, cost and buildability.

- Suggested activity: Comparing the embodied carbon of two structural options from declaration data.
- Suggested activity: Running a pre-demolition audit on a case building.
- Suggested activity: Drafting circular award criteria for a design and build tender.



Capstone Output

Each participant completes a circular construction and carbon roadmap. It contains circular objectives and indicators, a carbon baseline and target, design and material priorities, a reuse and waste plan, procurement clauses and a reporting format. It is used to brief project teams and to report progress to boards and funders.

Frequently Asked Questions

Is circular construction and embodied carbon training suitable for senior leaders without a carbon background?

Yes. It is set at advanced level for leaders who own portfolios or projects, and assumes experience of construction or asset management but no prior life cycle assessment practice.

Which standards does the circular construction and embodied carbon programme rest on?

It rests on ISO 59004 and ISO 59020 for circular economy, ISO 14040 and ISO 14044 for life cycle assessment, ISO 21930 for product declarations and ISO 20887 for design for disassembly.

How is the circular construction and carbon roadmap used at work?

You can use it to brief design teams, set carbon and waste targets, write circular clauses into tenders and report progress to funders.