

Buildings as Material Banks

Leadership

Points: 2

Developed by GBCA in partnership with Kennett Builders and dsquared Consulting

Outcome

The project encourages reuse of building elements at the end of life.

Rating Tool Applicability

- Green Star Buildings NZ
- Green Star – Design & As Built

Criteria

Credit Achievement	1 point	<ul style="list-style-type: none">• The recovery and reuse potential of the building's materials is assessed• A material bank of key materials for the building is developed
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Exceptional Performance	1 point	In conjunction with the <i>Credit Achievement</i> : <ul style="list-style-type: none">• A disassembly plan for the building is provided
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Additional information

Stage implementation

Strategy **Brief** **Concept** **Design** Tender **Construction** **Handover** Use

Synergies with other credits

- Responsible Procurement
- Responsible Products (Structure, Envelope, Systems and Finishes)
- Upfront Carbon
- Life Cycle Impacts

Sustainable Development Goals

- Goal 9 (Industry, Innovation and Infrastructure)
- Goal 11 (Sustainable Cities and Communities)
- Goal 12 (Responsible Consumption and Production)
- Goal 13 (Climate Action)

Why is this Leadership Challenge important?

The built environment is a major contributor to climate change and resource consumption, accounting for approximately 50% of all materials consumed. Construction and demolition waste from buildings is also responsible for 40% of solid waste.¹ This use of materials and resources and the high production of waste is a product of the linear economy of take, make and dispose. A move towards a circular economy can change this system to a closed loop system where the aim is to retain the value of resources and materials.

The concept of buildings as material banks (BAMB) reframes buildings to be repositories of high-value materials that can be reused rather than becoming waste at the end of the building's life, aligning with the circular model. This requires materials in a building to be documented so that their value is defined for reuse.

Similarly, designing buildings to be able to be disassembled and a disassembly plan increases the potential for building elements to be reused, as the value of the products and materials are retained when the building is deconstructed.

This Leadership Challenge aims to incentivise buildings to be designed to maximise the potential for their elements to be reused at their end of life.

¹ [2022 Global Status Report for Buildings and Construction](#), United Nations Environment Programme

Requirements

Credit Achievement

The projects must comply with **both** of the following criteria:

- Recovery and Reuse Assessment
- Material Bank

Recovery and Reuse Assessment

During concept or design development, an assessment is undertaken to explore the future recovery and reuse potential of 3 materials within the top 5 materials (by mass) in each of the following layers of the building:

- Structure
- Envelope
- Finishes
- Systems

At a minimum, the assessment:

- Evaluates the potential for future recovery and reuse for the identified materials against the principles *in ISO 20887:2020 Design for disassembly and adaptability — Principles, requirements and guidance*;
- Identifies solutions to maximise recovery and reuse at the end of life of the building;
- Provides a justification for the materials that have been identified to be unable to be recovered and reused against the principles in *ISO 20887:2020*.

Refer *Guidance* section for further details on *ISO 20887:2020*.

Material Bank

The project team develop a material bank that includes at least 6 of the materials from the Recovery and Reuse Assessment. At least 2 of the materials are used in the structure of the building.

At a minimum, the material bank must include the following information:

- | | | |
|----------------------------|--|---|
| • Product name | • Expected design life | • End-of-use instructions |
| • Manufacturer or Supplier | • Installation data | • Relevant data sheets provided by the manufacturer or supplier such as product safety data sheets and environmental product declarations |
| • Dimensions | • Repair and refurbishment information | |
| • Material properties | • Deconstruction instructions | |
| • Location in building | | |

The material bank is provided to the building owner and the facilities management in an editable digital and hard copy format as part of the building user information. The information can be updated and edited by the facilities management team or other appropriate stakeholder groups.

The material bank is integrated with the building information modeling (BIM).

Exceptional Performance

In addition to the *Credit Achievement*, the projects must comply with the following criteria:

- Disassembly Plan

Disassembly Plan

The project team develops a disassembly plan for the building for at least the building's structure and one other building layer (i.e. envelope, finishes or systems).

At a minimum, the plan includes:

- A list of the products or materials that can be disassembled, noting their physical properties, material properties, location and design life;
- Data sheets that are directly provided by the manufacturer or supplier, such as product safety data sheets and environmental product declarations;
- Details on the manufacturer or supplier for the products or materials;
- Instructions on how to deconstruct the elements including steps for dismantling including sequencing and safety measures, a list of tools and equipment needed for disassembly and whether testing and recertification of material properties is required;
- Instructions on storage and recovery

Information from the building's material bank may be used however the relevant disassembly, storage and recovery instructions for each product or material should be clearly linked.

The disassembly plan is provided to the building owner and the facilities management in a digital and hard copy format as part of the building user information. Information on where the disassembly plan can be located (both a digital and hard copy) is included in the building user information.

Submission content

Submission for this credit must contain:

- **Submission form**
- **Evidence** to support claims made in the submission

Recommended evidence:

- Recovery and Reuse Assessment
- Material bank
- Evidence that demonstrates the material bank and/or disassembly plan has been provided to the building owner and the facilities management in the specific formats
- Evidence of BIM integration of the materials bank
- Disassembly plan
- Extracts of the building user information

Alternate documentation can also be used by project teams to demonstrate compliance.

The recommended evidence listed above applies to the As Built submission. See the Design Assessment documentation section in the Introduction of the Submission Guidelines for more information on submitting evidence for the Design Assessment.

The key requirement is that evidence is provided to support each claim made within the Submission form.

Guidance

ISO 20887:2020 Design for disassembly and adaptability — Principles, requirements and guidance

The principles are outlined in Clause 5.3 of ISO 20887:2020, including ease of access to components and services, independence, avoidance of unnecessary treatments and finishes, supporting re-use (circular economy) business models, simplicity, standardisation and safety of disassembly.

It is expected that all these principles are considered; however, in some situations, some of the principles may not be applicable, as noted in Clause 4.3.1 of ISO 20887:2020. In such cases, an explanation to justify why the noted principles are not relevant is to be provided.

Supporting information

The following resources support this credit:

- [Buildings as Material Banks](#)
- ISO 20887:2020 Design for disassembly and adaptability — Principles, requirements and guidance
- [How to write a Building Disassembly Plan](#), Built and Coreo