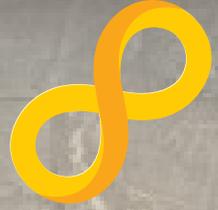


Circular Economy Model Office Guide



The what, why and how of designing out waste in office refurbishments and builds



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Foreword

It is with great pleasure that we are releasing this fantastic cross-industry collaboration guide for a model circular economy office. This is the first guide of its type in the world. It has been produced to demonstrate how circular economy principles can be practically integrated into office refurbishments or builds whilst also realising financial, environmental and social value.

The circular economy offers New Zealand a tremendous opportunity for sustainable growth – growth that does not rely on using more resources but optimising the utilisation of resources already in circulation.

I'd like to acknowledge and thank all of the individuals, organisations and members of the Sustainable Business Network who have contributed to this guide (you can see the list at the end of the guide) and a particular thank you to the New Zealand Institute of Architects and Designers Institute of New Zealand for encouraging their members to get involved and support the initiative.

So who wants to lead this? We now need to show it working in practice. We want to see a number of circular economy model offices throughout New Zealand. If this sounds like you, please promote the initiative with your clients and within your organisations. I look forward to seeing this becoming regular practice in all our office refurbs!

Ka kite ano



Rachel Brown
CEO, Sustainable Business Network
June 2015

Introduction

A circular economy is one where the lifecycle of materials is maximised, usage optimised and at the end of life all materials are reutilised.



A Circular Economy Model Office (CEMO) aims to minimise waste created by the refurbishment and build of offices by using the principles of a circular economy.

It is a viable and more efficient alternative to the prevailing ‘linear’ (take – make – waste) model where tonnes of needless waste from office refurbishments and builds ends up in landfill sites around the country.

This Guide and associated Specification has been created by a cross-section of industry as a first step in making circular economy offices the norm as opposed to the exception.

The Guide, which covers hard fit-out and furniture selection of an office refurbishment or new build, outlines simple principles, provides ‘how to’ information and shares practical knowledge and experience.



Drivers for change

A growing body of evidence shows that there are strong financial drivers for a Circular Economy Model Office, as well as both environmental and social benefits.

Financial

- Savings on new materials, e.g. renovating ceiling tiles costs half as much as purchasing new ones.
- Savings on landfill and associated transport costs, e.g. landfill costs can be around \$120 per tonne for general construction waste.
- Generating value from waste streams where possible, e.g. selling unwanted office furniture.

Environmental

- Reducing the need for virgin material, putting less strain on the Earth's resources, both from a raw materials and an energy perspective.
- Reducing transport costs, since the more in-situ materials that are used the less will need to be transported to site.
- Minimising waste volumes. It is estimated that construction and demolition waste accounts for approximately 50% of all waste generated in New Zealand.

Social

- Assisting charitable organisations via product and materials donations from the refurbishment, which they can distribute to those in need.
- Creating jobs via stimulating supply and demand for re-purposed materials.

Overview

The basic principles of a Circular Economy Model Office are:

- As many of the existing materials as possible are to be reused in the office fit-out.
- When new materials are required, the supplier must provide an end of life solution (excluding landfill).
- Waste generated must be diverted from landfill, either for re-use or recycling.



The process for achieving a Circular Economy Model Office, outlined in this Guide, is:

Stage 1 - Cataloguing and analysing existing materials

Materials that are currently available on site and are fit for purpose

Stage 2 - Design

The design principles that need to be employed to achieve a Circular Economy Model Office. This includes the selection of new materials

Stage 3 - Build

The processes and considerations that need to take place at the build stage as well as the 'how to's'

Stage 4 - Soft fit-out/furniture

The key considerations and 'how to's' for reusing furniture elements

Stage 5 - Review and evaluation

Measuring success

Case studies will be added, building a platform of knowledge - learnings, practical tips and hints derived from real life examples to help your project achieve success.

Stage

1

**Cataloguing
and analysing
existing
materials**

It is imperative that before any design or, crucially, demolition work is carried out, the existing materials are analysed in terms of suitability for re-use, repurposing opportunities and alternatives to sending any unwanted or unusable materials to landfill.

Step 1

Site visit to ascertain and catalogue the type and quantities of materials in-situ. See Existing Material Matrix – Project Specific (Appendix 1) for a template of how this is managed.

Step 2

Analysis of materials using the Existing Materials Matrix – Overview template (Appendix 1), to determine reuse or repurposing opportunities and alternative solutions to landfill.

Step 3

Provision of information to architect or designer via completed Existing Material Matrix – Project Specific form (Appendix 1).

Consideration:

If taking over from an existing tenancy, try and develop a relationship with the former occupants as early as possible to ascertain what materials and products they may wish to leave behind. Such a negotiation is likely to be welcomed as it may assist in lessening the cost (and waste) associated with a ‘make good’ clause at the end of their lease period.

Stage

2

Design

The Materials Matrix (Appendix 1), forms will enable tracking of materials that can be reused and also highlight gaps where new materials are required, informing Design stage selections.

It should be noted that the 2004 Building Act takes precedence over the Materials Matrix and vigorous quality assurance plans, inspection, testing, engineer sign off, producer statements and certificates of design may be required. Particular consideration needs to be given to such elements as structural stability, fire rating capability and requirements for durability of not less than 50 years.

Maximising the usage of existing materials by incorporating them into the design is the most tangible way of achieving a Circular Economy Model Office, however there are other design principles that can be applied to maximise the beneficial impact of the crucial Design stage.

For example

- Design and record guidance for **deconstruction** so that at the end of life materials can be extracted from the site in a state that will retain their value and ensure they are reusable.
- Consider how the building will use energy resources for heating and cooling, since this is fundamental to energy efficiency. The reuse of existing products needs to be balanced with the benefits derived from more energy efficient products.

Particular considerations for washrooms

The washroom environment offers multiple opportunities for reuse of materials. Many surfaces and materials will appear 'as new' post cleaning or with some simple regrouting. Of course to maximise the life of materials and facilitate resource conservation (minimising the use of water and cleaning products) impervious and durable surfaces not affected by moisture should be used.

Also is it crucial that soap, hand towel and toilet roll dispensers are considered at the design stage so they complement the functionality and aesthetic of the washroom design. Engage professional hygiene suppliers that have a dispenser recovery and recycling program to divert old dispensers from landfill. When new dispensers are required, look for features such as consumption reduction functionality, robustness and timeless design. Select towel and toilet paper refills that are from sustainable sources, locally produced and compostable to minimise your ongoing impact on the environment.



New materials

It is almost inevitable that new materials will be required for the project and product selection for a CEMO is based on the following simple criteria.

The supplier must provide an end of life solution ensuring all major components (more than 5% by weight) are reutilised or recycled.

Why are we asking for suppliers to provide an end of life solution?

Suppliers taking end of life responsibility for the products they sell is fundamental to achieving a more circular economy. This is primarily because it provides a real driver to influence the design of products to be more circular. Suppliers become incentivised to consider aspects such as how to maximise the life cycle, reusability and recyclability of the materials as well as how they can deconstruct the product to easily harvest materials.

New materials must be logged on the Introduced Materials Matrix (Appendix 1) indicating compliance with the criteria.

To determine compliance, suppliers of new materials need to complete the end of life commitment for new products form, (Appendix 2).

Other considerations

- Select materials that have long life cycles so there will be fewer requirements for replacement.
- Consider leasing rather than purchasing products, which would create an incentive for the manufacturer or supplier to maximise the life cycle of the product.

Stage

3

It is imperative that all contractors working on site are fully aware of the CEMO concept and objectives.

Build

Preparation stage

Three broad material classifications need to be implemented at this stage with suitable processes for each.

- Existing materials remaining in-situ
- Existing materials remaining on site
- Existing materials to be removed from site

It is imperative that all contractors working on site are fully aware of the CEMO concept and objectives. Particular focus needs to be given to the deconstruction of those materials to be reused as opposed to their demolition, as well as proper separation and storage, to ensure as much of the value of the materials is maintained as possible. A minimum of a CEMO 'tool-box' briefing is therefore required for all contractors on site, including clear demonstration of the requirements for deconstruction.

Existing materials remaining in-situ

Materials should be clearly marked, "Do not remove - leave in place".

A full list of materials clearly identifying those to remain in-situ should be provided to contractors carrying out removal work via the completed Existing Materials Matrix - Project Specific form (Appendix 1).

Existing materials remaining on site

Materials remaining on site should be clearly marked with appropriate instructions, e.g. "Deconstruct carefully and store in a suitable place", as well as logged on the Materials Matrix - Project Specific form (Appendix 1).

For CEMO General Specification refer to Appendix 3.

Stage

3

Build cont...

Existing materials no longer required

Materials should be clearly marked, "Remove from site".

Where possible, the original supplier should be contacted to determine if they have a product stewardship/end of life collection scheme in place.

Appropriate processes should be put in place for removal in conjunction with the waste provider. Please specify that materials should not be sent to landfill where alternative solutions exist.

The waste provider must be instructed to track and supply details of the waste volume removed from site and record where it is sent.

See Materials Matrix - Overview (Appendix 1) for details of which organisations can collect different materials and divert them from landfill.

Build stage

Refer to the general specification for CEMO projects (Appendix 3).

It is imperative that all those involved at the Build stage are fully aware that they are working on a CEMO project.

Incorporation of all selected materials (existing, repurposed and introduced) needs to be programmed into the Build to ensure integrity of material selection and use.

Regular updates and tracking of compliance to specification should be built into site meetings and reiterated in 'tool-box' talks.

On completion, the Materials Matrix Form should be updated and form part of the Building Management System so it can be used at the next refurbishment.

Stage

4

The soft fit-out can represent a significant proportion of the value of the project, meaning reuse and repurposing for this stage is likely to produce significant value.

Soft fit-out/ furniture

Furniture should be classified and clearly marked as:

- i) Remaining on site
- ii) Refurbished on site
- iii) Removed from site.

Please see Materials Matrix – Overview (Appendix 1) for organisations that will uplift unwanted office furniture. Other options include TradeMe or auction houses.

A key consideration for the purchase of new furniture, as well as meeting the CEMO requirements for new product selection, is long term adaptability and the avoidance of products that are likely to be a victim of changing fashions.



Stage

5

**Review and
evaluation**

Key information required for reviewing the CEMO is:

- Client and user satisfaction
- Amount of existing materials re-used
- Amount of materials diverted from landfill
- Amount of new materials meeting the Introduced Product Criteria.

The designers, contractors and waste providers will be able to provide details.

The CEMO Declaration Form (Appendix 4) can then be completed and proudly displayed in the Circular Economy Model Office.



Links

with other building initiatives, certifications and tools

CEMO sits well and overlaps with Green Star, BASE and the Living Building Challenge (LBC). These rating tools have requirements for reuse, recycling, deconstruction and waste diversion, for which CEMO provides in-depth direction.

See Appendix 5, for specific information regarding CEMO links with other building initiatives for further information.

Other useful resources

REBRI (Resource Efficiency in the Building and Related Industries) has a range of resources to assist in the diversion of waste from landfill on its website. REBRI's purpose is to promote, advocate, and assist resource efficiency measures in the building and related industries.



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For more information and appendices see the
Circular Economy Model Office section at
www.sustainable.org.nz/projects

Stage

2

**Design
cont...**