PROJECT Mountain Equipment Coop

YEAR
2000

LOCATION
Ottawa, ON, Canada

USE
Mercantile

CONSTRUCTION
New Construction

ARCHITECT
Linda Chapman, Christopher Simmonds, Pawel Fiett, Kristen O'Connor, Christopher Moise

ENGINEER
Cleland Jardine Engineering Limited

DEVELOPER
0

BUILDER
Justice Construction

SUPPLIER
0

SPECIALISTS
by dEsign (waste management consultant), Enermodal Engineering (C2000 consultant)

GROSS AREA
26,700 sq-ft

MEAN ROOF HEIGHT
30 ft

STORIES ABOVE GRADE
2

STORIES BELOW GRADE
0

RISK CATEGORY
II

COST INFORMATION
Unavailable

LCA INFORMATION
Unavailable

Credit: MEC

PRINCIPLE	SCALE	SYSTEMS	MATERIALS
DESIGN FOR DISASSEMBLY	**Elemental** Subsystems Whole-structure	Non-structural Envelope Balconies Stairs/ramps Foundations Beams Bracing Walls **Roof** **Floors** Columns	Other Earthen **Wood** **Steel** Masonry Precast concrete Insitu concrete
STRUCTURAL COMPONENT REUSE	Whole-structure Subsystems **Elemental** **+Deconstruction**	**Columns** Floors Roof Walls Bracing **Beams** Foundations Stairs/ramps Balconies Envelope Non-structural	Insitu concrete Precast concrete Masonry **Steel** **Wood** Earthen Other

SUMMARY

A two-story retail building in Ontario was constructed using reused structural materials from a building deconstructed on the site. The building was expanded in 2012 with a minimal level of demolition taking place. Design for disassembly concepts were also incorporated into the new building.

SUSTAINABILITY GOALS

The owner had significant interest in sustainability and reuse that align with their company values) above aesthetics

The project met C2000 low energy design standards, and LEED gold.

A target was set for 80% of materials for the project to be sourced from within 500km of site.

CIRCULAR ECONOMY STRATEGIES

Half of the material for the new building (or 75% of the deconstructed building) was sourced from the existing 40-year-old building on the site. The steel structure was a significant component of the reused material. Wood was also salvaged from a site nearby.

Steel columns, beams, and open-web joists that previously supported the existing 1-story building's roof were repurposed to support the roof of the new 2-story building. Half of the total roof joists in the new building were reused steel, supplemented with new steel joists and a new steel deck. Span dimensions of the existing building were maintained in the new building. Joist spacings were tightened in some locations to accommodate roof penetrations and rooftop equipment. Specifications and drawings from the existing building were available to the design team and contractor, which helped justify the reused steel material properties. Steel members from the existing building were labeled as they were dismantled, then inspected by the structural engineer.

The first floor of the new 2-story building is supported by Douglas fir columns and beams that were salvaged from another location.

Design for Disassembly detailing included bolted steel connections, panelized and screwed wood members, exposed steel structure.

The intiial construction completed in 2000 was expanded in 2012. In this expansion process 85% of the intiial building was maintained.

KEY FINDINGS, RECOMMENDATIONS, AND LESSONS LEARNT

- A motivated client and project team are essential

- Identifying structural characteristics of reused steel material is much easier if the original plans and specifications are available

- Some contractors may be tentative about bidding on a project incorporating reused material, leading to slightly higher bids. Contractor education is essential.

- Steel reuse is simpler if the members can be reused in a similar application (layout, span) as they were used for originally.

FURTHER INFORMATION AND RESOURCES

https://www.canadianarchitect.com/designing-for-disassembly/

https://wasteheritageresearch.wordpress.com/2018/02/27/mountain-equipment-coop-ottawa/

https://www.yumpu.com/en/document/read/33628315/mountain-equipment-co-op-ottawa-ontario-reuse-steel

https://wasteheritageresearch.wordpress.com/2018/02/27/mountain-equipment-coop-ottawa/

AVAILABLE QUANTITATIVE DATA

13% increased upfront construction cost when compared to traditional construction.

Half of materials for new 2000 construction were sourced from the exisintg building on the site.

ABOUT THE DATABASE

This case study has been prepared by the Structural Engineering Institute Sustainability Committee Circular Economy Work Group with the goal of sharing and promoting the excellent circular economy work that project teams are working on throughout North America and the world. Often it is hard to find information on how circular economy principles are implemented in practice; these circular economy case studies aim to better share information amongst the industry.

Some case studies have been prepared directly by a project team member, while others have been prepared based on available texts and publications. In the second case, the text descriptions are a summary of information available from other sources. These sources are referenced in the *Further information and* resources section.

While reasonable efforts have been made to ensure the information is representative and accurate, we cannot guarantee there are no errors. Please contact the case study team to provide additional information, suggest updates and amendments, or with any other questions. To submit a new case study to the database, please use this submission form. Thank you!