



Constructing a mass timber visitor centre

featuring CRD wood

This case study was developed to showcase applied circular principles and business/organizational practices and is intended only for educational and/or informational purposes.

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1. Introduction

Parks Canada has long-recognized the benefits of reintegrating wood from its construction, renovation, and demolition (CRD) projects into new park facilities and infrastructure. At the Gros Morne National Park Visitor Reception Centre, the Agency is showcasing how reclaimed CRD wood can be repurposed in a mass timber renovation and expansion.

The renewed centre incorporates seven wood beams from the original building in both structural and functional capacities. Reopened to the public in May 2024, the centre was intentionally designed to celebrate the park's history, landscape, and local cultures, and integrate sustainable and universal design. The project successfully achieved LEED certification¹ due, in part, to the reuse of the original beams, as well as other measures, such as the introduction of alternative sources of power, energy metering, and carbon capture construction technologies, which also aligned with federal greening strategies.

New beams were also integrated with those from the original building and new glulam timber framing. Today, visitors to the centre can view the reclaimed beams in the ceiling of the lounge area and in its benches. Using a glulam² calculator, the weight of the reclaimed beams varies from 2,200– 3,200 kgs at 5 metres long (approx.). The new mass timber beams each weigh about 3,200 kgs, although the longest (in the Exhibit Gallery) eclipses 11,000 kgs at 17 metres long.

About the Project Partners

Parks Canada protects and presents nationally significant examples of Canada's natural and cultural heritage and fosters public understanding, appreciation, and enjoyment in ways that ensure their ecological and commemorative integrity for present and future generations, on behalf of the people of Canada.

Pomerleau is a Canadian construction firm that is committed to sustainable development and the highest standards of environmental management for its projects. New Brunswick's **Design Plus Architecture** designed the new visitor's centre, and the beams were certified for reuse by **GEMTEC Consulting Engineers and Scientists**.

Key Facts

Location: Newfoundland and Labrador.

Integrated CRD wood: 7 beams (of 14 used) helped achieve LEED certification.

LEED certification: The project had to achieve 50–59 certification points. The beams contributed 3 of 5 possible points.*

GHG savings: Reusing the beams saved emissions equal to 52 metric tons of greenhouse gasses, equivalent to 47 football fields of forest sequestering carbon dioxide for one year (see Footnote 4).

Cost savings: Calculations indicate it was at least 50% of the total cost to manufacture.

* Material re-use certification points for the Building Life-Cycle Impact Reduction category were awarded by demonstrating a minimum 10% reduction in at least 3 of 6 categories.

¹ LEED (Leadership in Energy and Environmental Design) is a green building rating system. Certification provides a framework for healthy, highly efficient, and cost-saving green buildings that offer environmental, social, and governance benefits.

² Glulam refers to glued-laminated timber.

The renewal of the visitor centre was a major undertaking that required the partial demolition of the original visitor centre (the existing theatre walls and floor slab were retained, as well as some foundation footings along some exterior walls.) It was then reconstructed as a fully updated and much larger facility, at 1,125 m².



Reclaimed wood beams used in lounge ceiling.



Reclaimed wood beams used as benches.

The Gros Morne Visitor Reception Centre showcases how reclaimed CRD wood can be reused in new and beautiful ways in combination with mass timber. It introduces a scalable circular approach to renovating and constructing facilities and infrastructure in Canada's national parks, as well as potentially other cultural and educational settings. This case study examines the challenges, solutions, and outcomes to date.

2. Project Challenges and Solutions

The renewal of the Gros Morne Visitor Reception Centre was focused on sustainability, accessibility, and cost-effectiveness. As construction contractor Pomerleau describes, the beams were “well over-designed for their new use, so this was a straight-forward process.”³ However, two challenges became apparent during the partial demolition and reconstruction.

Removal of original beams

The greatest challenge was removing the load bearing, and very heavy, beams from their original locations in the centre. The beams were fully integrated into the building structure, fastened with large bolts and cleats. The materials and hardware that were attached to the beams had to be meticulously removed before a crane was used to hoist the beams up and away. Throughout deconstruction, care was taken to protect the beams from damage and prevent an unintended collapse of the building.

³ See Pomerleau. <https://pomerleau.ca/en/project/gros-morne-national-park-visitor-centre>

This was also a way for the new building to have a connection to the original, and to continue a small local legacy... Visitors are quietly impressed when they are told about the beams.

– John O’Neil, Parks Canada

Point Pelee National Park

promoted circular economy principles by reusing reclaimed CRD wood in its bridges. One 35-foot bridge near the Northwest Beach was rebuilt mostly of Douglas fir timber from the park’s original marsh boardwalk, built in the early 1960s and replaced in 2018.

Upcoming projects where Parks Canada is considering the reuse of salvaged wood are **Jasper National Park**, following the 2024 fires, and **Rouge National Urban Park**.

CRD wood reclamation process

1. Contractor detached the wood beams in the original centre.
2. Beams were transported, sorted, and stored at a local wood shop.
3. Beams were sanded and finished (reclaimed) at the wood shop.
4. A structural engineer determined the structural capacity of the ceiling beams was acceptable. Wood was then cut to suitable lengths, and stamped and certified by the engineer.
5. All beams were transported back to the construction site.
6. The ceiling beams were integrated with the new mass timber, which was designed to match.
7. Furniture beams were purpose-cut and finish-coated at the construction site to match centre specifications.

Location for storing and processing

The contractor intended to use seven of the original beams in the new centre, and transported them to a local woodshop for storage and processing. Reclamation of the beams reduced the logistical challenge involved with transporting the volume of new mass timber, which included an additional seven beams, to this remote location.

The reclaimed beams that were to be used in a structural capacity were sanded, finished, cut, and certified by a structural engineer before being brought back to the site. Beams that were to be used to build benches were purpose-cut, sanded, and finished at the centre.

3. Outcomes, Benefits, and Opportunities

While LEED certification may have been a primary driver of this project, the re-use of the wood beams also added significant heritage and environmental benefits.

Benefits

Connection: The project architect used the opportunity presented by the pursuit of LEED certification to keep something of the original centre in the new one. The re-use of CRD wood was a way for the new building to maintain a connection to the original. The new building reflects and celebrates the surrounding environment, history, and cultures, and the reclaimed beams are a frequent talking point among park visitors.

GHG emission reduction: To lessen the project's environmental impact, Parks Canada reused parts of the original visitor center, including the wood beams.

This saved emissions equal to 52 metric tons of greenhouse gases, the same amount as 47 football fields of forest sequestering carbon dioxide for one year.⁴

Opportunities

Modelling best practices: The new, expanded visitor centre showcases the use of mass timber construction practices featuring CRD wood, and how its integration helps to create a sustainable, fully accessible, upgraded building that serves everyone. It provides a model for circular climate change solutions and sustainable tourism.

Building expertise: In addition to featuring the use of reclaimed lumber, the upgraded visitor centre makes a contribution to the success of Canada's mass timber sector. Today, manufacturing facilities are expanding across the country. As expertise and local knowledge grow, the Gros Morne project provides a model for those who wish to combine the newest technologies with something of the old.

Wood requires 6 times less carbon for its production than steel or concrete while storing 1 ton of CO₂/m³ during its growth. (State of Mass Timber in Canada, 2021).

Mass timber is a low-carbon building material that is gaining in popularity among designers and builders. The Canadian mass timber market is developing, with new entrants to the market nearly every year. The glulam market is both the most competitive and most developed, with manufacturing capacity having existed in Canada for decades. (State of Mass Timber in Canada, 2021).

⁴ LCA Calculations: Baseline value for GWP 157,883.23 kgCO₂e; Proposed building value for GWP 105,839.01 kgCO₂e; Difference 52,044.22 kgCO₂e (savings).

<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

Equivalent = 62.1 acres of US forest for one year; 1.32 acres in a football field; $62.1/1.32 = 47.045$ football fields of forest sequestering carbon for one year.

4. Conclusion

The integration of mass timber construction featuring reclaimed CRD wood at Gros Morne National Park makes a significant contribution to our collective appreciation and understanding of how circular principles can be put into practice. The additional uses of reclaimed wood in non-structural features (such as benches) point to additional secondary markets for this material, and options for repurposing wood from an original site. The renewed Visitor Reception Centre honours the history of the park and the existing landscape and peoples, while introducing the public to the future of sustainable building in Canada. And, it provides a viable model that can be replicated in Canada's national parks and other cultural and educational facilities from coast to coast to coast.

Recommended Resources

CBC News (August 7, 2024). *[Here's what the \\$12M makeover of the Gros Morne National Park visitor centre looks like.](#)*

Government of Canada (2024). *[Green Construction Through Wood Program.](#)*

Natural Resources Canada (2021). *[The State of Mass Timber Construction in Canada.](#)*

Government of Canada (May 17, 2024.) Press release: *[Re-opening the Gros Morne National Park Visitor Centre.](#)*

Project Partners

John O'Neil, Project Manager, Project Delivery Services, Parks Canada

Role: Management, coordination, and design including management of design and construction contracts; serving as primary liaison among project partners; developing the functional plan for the building; hiring the architectural and engineering teams; setting the parameters and vision for the project; design and construction decisions; approval of all architectural and interior design decisions; and more.

Website: parks.canada.ca

Trevor Shiomi, Acting Manager, Sustainability Services, Parks Canada

Role: Parks Canada sustainability lead within the Technical Services team of the Real Property and Assets Directorate.

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Keith Burt, Construction Manager, Pomerleau

Role: Demolition of existing building; reconstruction of expanded visitor centre.

Website: pomerleau.ca

Leo Goguen, Architect, Design Plus Architecture

Role: Design of the centre.

Website: designplus.pro

Daniel Sonier, Structural Engineer, GEMTEC Consulting Engineers and Scientists

Role: Inspection and certification of reclaimed lumber.

Website: gemtec.ca

Photo credits

Cover page: Interior featuring reclaimed wood beams from Parks Canada (Sheldon Stone). Page 2(i): Reclaimed wood used in furniture from Parks Canada (John O’Neil). Page 2(ii): Lounge featuring reclaimed wood beams (ceiling) from Parks Canada (Darren Nicolle).

About this series: The Waste Reduction and Management Division profiles opportunities to recover and reintegrate construction, renovation, and demolition (CRD) materials to develop the circular economy of Canada’s CRD sector. This series focuses on the diversion of wood from landfills through improved secondary markets, boosting recovery of materials, and connecting supply and demand.