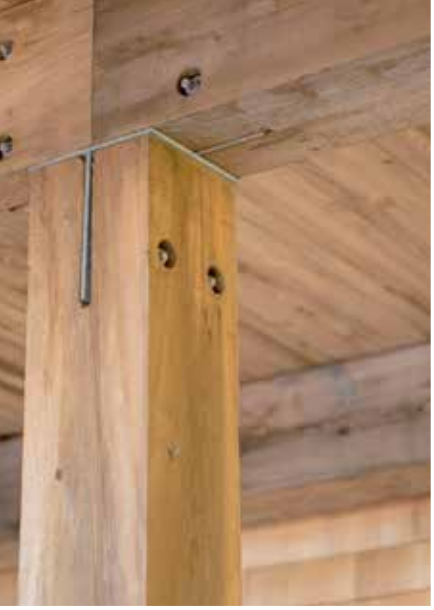


SPECIAL 8-PAGE SUPPLEMENT

MASS TIMBER

SPRING/SUMMER 2017 – VOLUME 5, ISSUE 1

WHAT'S INSIDE

woodWORKS! Program of the Canadian Wood Council

cecobois Centre d'expertise sur la construction commerciale en bois

Canadian Wood Council / Conseil canadien du bois

THOMPSON RIVERS UNIVERSITY OLD MAIN ACADEMIC BUILDING ADDITION
PHOTO CREDIT: ED WHITE PHOTOGRAPHICS

Massive Strides for Wood in Construction

Advancements in wood product technology and systems are driving the momentum for innovative buildings in Canada. Products such as cross-laminated timber (CLT), nail laminated timber (NLT) and glue laminated timber (glulam) are part of a bigger classification known as mass timber – construction that uses large, prefabricated wood elements for applications in walls, floors and roofs.

Tall wood buildings are an application of mass timber construction, and one that is growing in popularity in Canada thanks, in part, to examples such as the demonstration project at the University of British Columbia. Set for completion in the spring of 2017, Brock Commons Tallwood House will be among the world's tallest mass timber hybrid structures, at a towering height of 174 feet. Recognized by the design and construction community as a viable option for Canadians, tall wood construction is gaining momentum – and the Canadian Wood WORKS! program has the resources to help drive the change.

It's all about education!

Tall wood buildings are not a new concept, with contemporary examples in Australia, Austria, England, Italy, Norway, and Switzerland, all built within the last five years. The opportunity for new, larger and taller wood buildings is now being recognized in Canada because of the evolution of wood products and building systems. Technical assistance, events and case studies are just some of the tools developed by the Canadian Wood *WORKS!* program to educate people about the opportunities that exist for wood in construction. As you browse the mass timber projects highlighted in this magazine insert, it is our hope that you are informed about the advances to prefabricated wood products, inspired to use mass timber products in your next project and motivated to learn more about the benefits that wood has to offer. Learn more about the Canadian Wood *WORKS!* program at www.wood-works.ca.

Etienne Lalonde
National Director
Wood *WORKS!*

Interested in attending a Wood *WORKS!* educational opportunity in your region? Check out the events listed in this insert and get involved with your regional Wood *WORKS!* today.

This Wood *WORKS!* magazine insert was created to help inspire design professionals throughout Canada. Do you have a project that features wood as a primary building material? Take advantage of our Wood *WORKS!* magazine insert and get featured today! Contact Natalie Tarini at ntarini@cwc.ca, and share your story.

Mark your CALENDARS

2017-18 EVENTS

May 9
Wood Design Seminar Series
Moncton, NB
www.atlanticwoodworks.ca

May 10
Wood Design Seminar Series
Halifax, NS
www.atlanticwoodworks.ca

May 11
Wood Design Seminar Series
Saint John's, NL
www.atlanticwoodworks.ca

November 1
Ontario Wood *WORKS!* Awards Night
Toronto, ON
http://wood-works.ca/ontario/wda/

November 2
Toronto Wood Solutions Fair
Toronto, ON
http://wood-works.ca/ontario/wsf/

November 14
Wood Solutions Conference
Vancouver, BC
http://wood-works.ca/bc

November 22
Wood Design Luncheon – Kelowna
Kelowna, BC
http://wood-works.ca/bc

November 24
Wood Design Luncheon – Victoria
Victoria, BC
http://wood-works.ca/bc

2018

February 1
Montreal Wood Solutions Fair
Montreal, QC
http://cwc.ca/event/salon-solutions-en-bois-conferences-cecobois-2018/

PHOTO CREDIT: ARTEZ PHOTOGRAPHY/WOOD *WORKS!* BC

Wellington Secondary School

Nanaimo, BC

Located in Nanaimo on the east coast of Vancouver Island, Wellington Secondary School is a two-story, 115,712-sq.ft. structure with a capacity of 900 students from grades eight to 12. The school was built in several phases from 1969 to 2000, and was one of 339 schools in the province identified at high risk of structural collapse in the event of a major earthquake. An upgrade program was initiated to bring Wellington Secondary School up to current seismic safety requirements, and engineered wood was chosen as an expedient and economical retrofit solution.

The project demonstrates the ability of wood frame to replace an existing heavy precast framing system which was to be seismically upgraded with structural steel. This was demonstrated as a cost-effective, better-performing and more sustainable alternative to the original concept.

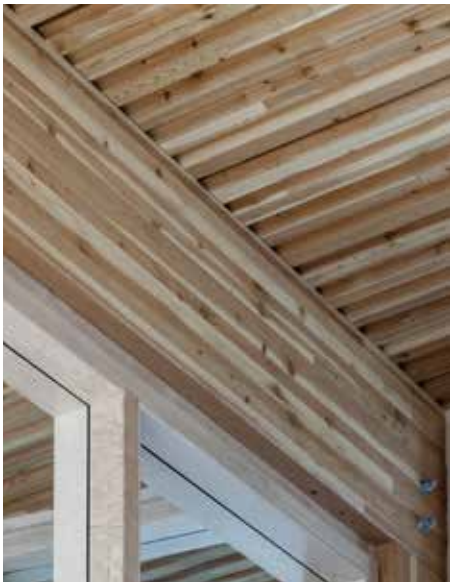
The use of wood frame significantly reduced the mass of the building and the need to upgrade foundations. The innovative analysis and design of the braced ring structure in the roof avoided the need for interior bracing which would have added foundations and limited the functionality of the exterior space. The choice of wood was both aesthetically pleasing and also allowed easy site adjustment to suit existing dimensions.

This was all done in an operating environment. The team efforts of the school district, architect, engineers, and construction manager made this difficult project possible while keeping the school in operation.

Wood has shown itself to have many positive attributes when incorporated into a seismic mitigation strategy. Its light weight, versatility and economy have combined to bring this project to a successful resolution, on time and on budget, while transforming the identity of this aging school.

CLIENT	ARCHITECT	STRUCTURAL ENGINEER	TIMBER SUPPLIER
School District #68 – Nanaimo Ladysmith	KMBR Architects Planners Inc.	Herold Engineering Ltd.	Structurlam Products LP

PHOTO CREDITS: GARTH CRUMP



Edmonton Community Foundation

By Emmett Gallagher & Kent McKay, Manasc Isaac

Edmonton, AB

By 2014, the Edmonton Community Foundation (ECF) had outgrown its digs; its success had created a need for more space to accommodate burgeoning staffing and programming needs. Yet, ECF's current home in the beautiful 1912-built McDougall House was too charming to abandon. A golden opportunity emerged in the form of a neighboring 1960s telecommunications building that had become vacant, so the ECF made the decision to acquire the property and consolidate the two structures. The project posed a unique challenge: how can two buildings from completely different eras, built in completely different styles and for completely different purposes be elegantly and functionally united as one? Edmonton firm Manasc Isaac was engaged to reimagine the two disparate structures into a new home for ECF.

The design team arrived at the solution to create a "link" building between the two existing structures. This link building would serve as the new reception area, meeting room and social event space for the ECF. To minimize the visual impact on McDougall House, the link building was designed to read as a distinct, transparent volume, in contrast to the opaque elements of the existing structures on each side.

The two existing buildings' finishes are varied, including concrete, steel and clay brick. The architect turned to mass wood to signify the link building, using glue-laminated heavy timber for the superstructure and ceiling. The warm, natural tones of the exposed timber warm up the contrasting cold and industrial palette, creating an inviting and comfortable space for many daily visitors to the ECF.

Heavy timber wasn't chosen just for its good looks, however. The design team undertook a comparison to weigh the pros and cons of the primary structural materials available in Canada (reinforced concrete, heavy steel, light steel, light timber). Taking into account myriad factors such as building size, function, budget, labor availability, schedule, carbon sequestration and occupant comfort, heavy timber nudged its competitors out of the running.

Bridging two existing buildings presented physical challenges: the team knew the three separate entities, each made of different materials, would expand, contract and move at different rates. Typically, heavy timber structures require cross-bracing in both directions to reduce lateral movement and ensure frame rigidity. Since visual cross-bracing the ECF wood structure would detract from the open feel of the space, the design team engineered bespoke moment connections, concealed at the base of each glulam column. Although moment connections are common in concrete and steel structures, additional innovation was required to implement them in ECF's heavy timber structure. Thanks to close collaboration with the heavy timber manufacturer, the design team was able conceal all electrical conduit within the structure itself, maintaining a clean, open space.

By choosing to invest in the historical legacy of McDougall House, in lieu of demolition and rebuild, the ECF demonstrated its commitment to enhancing the community in a sustainable manner. ECF is a relatively small project and proves heavy timber can be used on projects of all sizes, including new builds and renovations.

ARCHITECT
Manasc Isaac

STRUCTURAL ENGINEER
BPTEC Engineering

GENERAL CONTRACTOR
Clark Builders

TIMBER SUPPLIER
Western Archrib

InnPower Office

Innisfil, ON

To prepare for future growth and maximize efficiencies, InnPower (formerly Innisfil Hydro) consolidated three existing buildings into one new, larger facility. The new InnPower office building is a two-story, 41,979-sq.ft. (3,900 m^2) project located in Innisfil, Ontario.

The building contains offices, meeting and auxiliary spaces, as well as a shop/warehouse, storage garage, and two leased units that can later be reclaimed to accommodate future expansion.

The site is part of a multi-phase development that includes an operations center and works yard.

The sustainably designed building is a hybrid structure incorporating both wood and steel elements. The beautifully expressive and exposed heavy timber roof structure is comprised of glue-laminated timber beams and cross-laminated timber (CLT) panels.

CLT is known for its comparatively low embodied energy and ease of installation. Because the panels are prefabricated off-site and shipped in sequence, ready to install, CLT assemblies are erected very quickly with almost no site waste. The roof system for the InnPower project was installed mid-winter by a crew of four people in just three days. It took just one day to install the glulam beams and two days to install the CLT.

The versatile glulam-CLT system offered a cheaper solution than steel for the 41,979-sq.ft. roof and was still able to employ easy-to-use connections to integrate with the steel structure. The wood structural elements positively affected the project by shortening the construction timeline and reducing costs.

Compared with functionally equivalent buildings made of non-wood materials, wood-frame buildings typically generate less embodied greenhouse gas (GHG) emissions during their lifecycle; there are fewer GHG emissions associated with a wood-frame building than other building types. This difference can be significant, particularly when including the amount of CO_2 emissions that were avoided (displaced) by choosing wood over other more GHG-intensive materials.

A total of 30 m^3 of glulam and 184 m^3 CLT was used to complete the roof. Approximately 166 metric tons of carbon dioxide is stored in 214 m^3 of wood and a further 64 metric tons of carbon dioxide emissions were avoided by choosing wood over other materials. This carbon benefit is equivalent to taking 49 cars off the road for a year, or saving the energy needed to operate 24 homes for one year.

To access the Carbon Calculator and other free web-based design tools visit www.cwc.ca/resources.

OWNER
InnPower Corporation

ARCHITECT
MCL Architects.

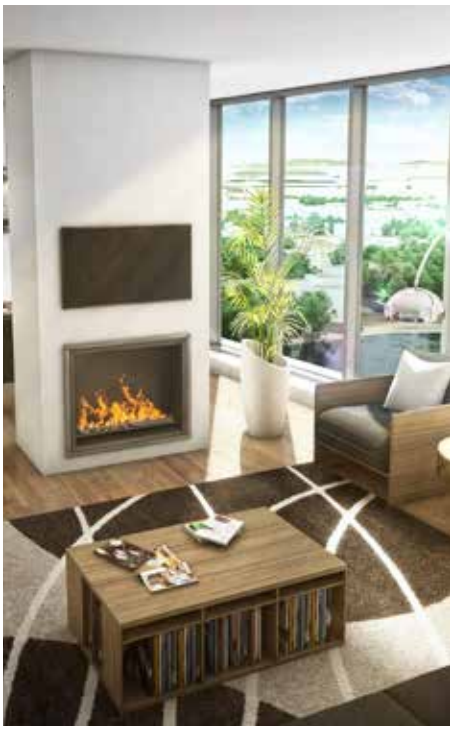
STRUCTURAL ENGINEER
SWS Engineering

GENERAL CONTRACTOR
BWK Construction Company Ltd.

TIMBER SUPPLIERS
Nordic Structures, Goodfellow Inc.

QUEBEC

ARCHITECTURAL RENDERINGS: YVAN BLOUIN ARCHITECT



Origine

Quebec, QC

More and more wood high-rise buildings are being built all over the world and Quebec is no exception to this trend. This past June, the construction of Origine, a 13-story condo building in the Pointe-aux-Lièvres eco-neighborhood, in Quebec City, was officially launched with great fanfare. And for good reason: once completed, it will be the tallest wood building in eastern Canada and the tallest wood-construction condo tower in North America.

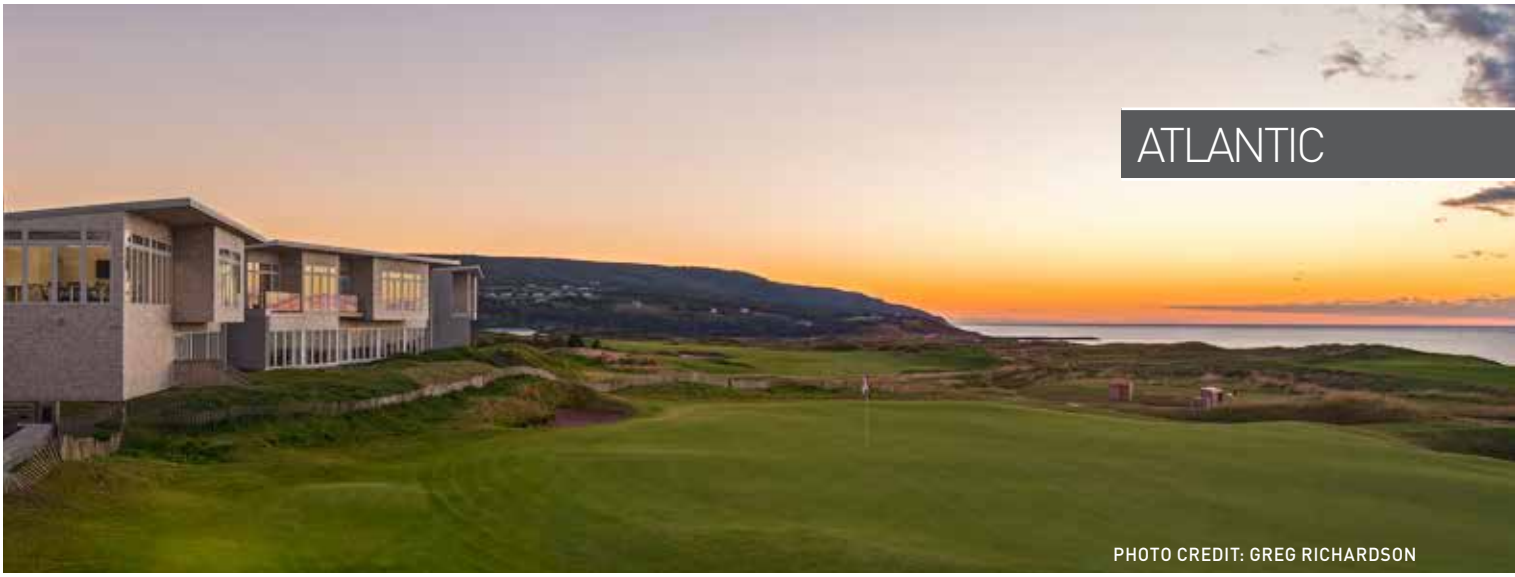
This 12-story solid timber structure, built on a concrete podium, will reach 134 feet in height. It is distinguished by the fact that its structure consists entirely of solid wood, as are the staircase and elevator cages and the cross walls and exterior walls. The building's structural system features a combination of CLT panels and glulam beams and columns. The designers also minimized the use of steel plates for the assemblies, instead favoring wood-to-wood assemblies using high-performance screws.

This project is the work of the NEB consortium which is composed of Nordic Structures, manufacturer of the solid timber frame, Yvan Blouin, Architect, and general contractor EBC. In order to have the project approved by the Régie du bâtiment du Québec, the group had to carry out several tests to demonstrate that the building meets the strictest requirements in terms of acoustic performance, seismic resistance and fire resistance. To this end, an impressive large-scale fire demonstration was conducted at the National Research Council of Canada in the spring of 2015 under the independent scientific supervision of FPInnovations and in the presence of several representatives of Quebec's fire safety services. The exercise served to demonstrate the preservation of the structural integrity of the stairwells even after two hours of burning at more than 1,000 F, and also demonstrated the structure's impermeability in terms of the spread of smoke.

The Origine project is paving the way for the construction of future wood high-rise buildings. Already, following the results of the fire resistance tests, the Régie du bâtiment du Québec, in collaboration with FPInnovations, has published guidelines for the construction wood-frame buildings of up to 12 stories, thereby eliminating the need for construction professionals to request similar measures.

PHOTO CREDITS: STÉPHANE GROLEAU

DEVELOPER	ARCHITECT	GENERAL CONTRACTOR	TIMBER SUPPLIER
Société NEB (Nordic Structures, EBC, Synchro)	Yvan Blouin Architect	EBC	Nordic Structures



Cabot Links

Inverness, NS

Located on the rugged west coast of Cape Breton Island, with tumbling sandy hills, and sweeping ocean views, Cabot Links is among the one per cent of courses that may truly claim "links" status. Inaugurated only six years ago, it has already made a name for itself as a global golf destination.

A links is the oldest style of golf course. The name means "rising ground" or "ridge" and refers to areas of coastal sand dunes between land and sea. A links course is sculpted to the landscape to balance topography, views, vegetation, and wind, with the game itself. The design of such a course demands sensitivity to the terrain. The Lodge at Cabot Links echoes this sentiment with its curved form following the contours of the land to express a vision of the complementary relationship between landscape, building and human play.

Sited between the town of Inverness and the Atlantic Ocean overlooking the Gulf of St. Lawrence, the lodge presents two contrasting faces. Fronting the town is a 350-foot curved, heavy timber wall clad in cedar shingle. The wall snakes though the site, connecting the lodges and leads arriving guests toward the course. The wall is a screen between the suite entrances and the parking area behind. It also supports an elevated walkway serving suites on the upper level.

Facing the ocean, the lodge presents a more open, lively elevation. Four, two-story volumes, each containing 12 suites, alternate with open stairways that add rhythm to the composition. A fifth volume, the reception and administration building, anchors the north end of the lodge. These volumes are clad in cedar shingles and punctuated by abundant glazing. Further animation is provided by a variety of projecting elements: some suites protrude from the facade ("bumps" in local parlance); others feature balconies; all sheltered beneath the overhang of the roof.

The reception and administration building and the (existing) neighboring restaurant building, together frame a terrace, with spectacular views of the ocean and golf course stretching across the landscape, linked by the heavy timber serpentine wall.

The design of the lodge resolved cost and code issues, while giving clarity to the construction and massing of the building. Dividing the lodge into a series of smaller modules, linked by a heavy timber walkway, allowed for the use of conventional wood construction, which, in turn, facilitated the use of local contractors and embedded the project more fully within the ecology and economy.

Due to proximity and limiting distances, the end walls of the individual buildings have stucco cladding that contrasts with the untreated cedar shingles and boards used on all other surfaces. The 14-foot grid of the rooms allow for shallow parallel chord wood trusses, reducing the overall height of the project, while separated double stud walls ensure acoustic privacy. LVL beams project out along the grid lines, supporting the cantilevered bumps and large overhanging roofs.

The heavy timber post and beam walkway has galvanized steel connections, raising the posts above the walkway to protect the end grain from moisture. The nail-laminated 2 × 4 timber structural decking follows the grid of the building, turning with the curve of the landscape providing both structure and finish material.

The Cabot Links Lodge grows out of both its landscape and cultural conditions. Wood construction is very much part of the vernacular of rural Cape Breton and allows the project to be embedded within the community. Dividing the building into separate lodges and linking them with the curved shingle wall creates a powerful form in the links landscape while allowing the project to be constructed to the requirements of a more permissive part of the building code, while featuring the warmth and beauty of wood construction and cladding.

ARCHITECT
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STRUCTURAL ENGINEER
BMR Structural Engineering

GENERAL CONTRACTOR
DORA Construction

NATIONAL PARTNERS

Canadian Wood Council / Conseil canadien du bois

Natural Resources Canada / Ressources naturelles Canada

STRUCTURLAM Intelligence In Wood

BSLC

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StructureCraft

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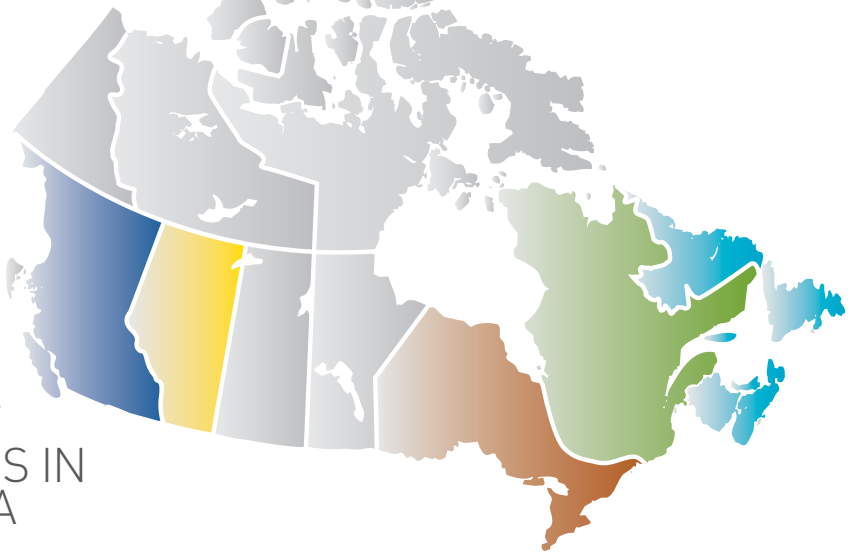
LP BUILDING PRODUCTS

Weyerhaeuser

Guardian Structures

WOOD *WORKS!* REGIONS IN CANADA



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