SPECIAL 8-PAGE SUPPLEMENT

INDUSTRIAL BUILDINGS

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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

WATERSHED CONSERVATION CENTRE, UPPER THAMES RIVER CONSERVATION AUTHORITY
PHOTO CREDIT: MITCH ALLISON

Wood Warehouse and Industrial Buildings Better for the Environment and Eyes

One needs only mention "industrial building" to evoke the image of a steel frame or concrete box. However, in the last 30 years, the wood products industry has made strides in new technologies such as prefabrication and computer robotic CNC machinery – making wood a viable alternative for industrial construction. Whether building an addition to an existing project or an entirely new building, wood products create an aesthetic warmth to the traditional rough and cold characteristics of industrial design.

This magazine insert features project examples throughout Canada that chose wood-based construction for their industrial buildings. Considering climate changes happening around the world, opting for a construction material that is naturally harvested, sequesters carbon dioxide, and is sustainable, is a consideration that should not be taken lightly. Howard Zinn once said, "We don't have to engage in grand, heroic actions to participate in the process of change. Small acts, when multiplied by millions of people, can transform the world."

Wood *WORKS!* is a program of the Canadian Wood Council that serves to educate and inspire the design and building community about the available applications for wood in commercial construction. The result? More buildings built with locally sourced and sustainable wood products. As an industry-led market development and diversification program, Wood *WORKS!* is a springboard for new and emerging wood products and building systems. The program's vision is to be passionate, credible agents of change leading to an advanced and sustainable wood culture in Canada.

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

October 5
Atlantic Wood Solutions Fair
Halifax, NS
http://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

December 13
Prairie Wood Solutions Fair
Edmonton, AB
http://cwc.ca/events/wood-solutions-fairs/

2018

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

BC Passive House Plant

Pemberton, BC

BC Passive House (BCPH) is a manufacturing company that prefabricates panelized building systems and heavy timber packages for high performance buildings. Completed in the summer of 2014, the BC Passive House Plant is an "all-wood" demonstration project. The building was the vision of a company dedicated to the concept of truly sustainable construction methodologies, typified by the international Passive House Standard. BCPH mandated that the facility design must exemplify a commitment to wood design and sustainable construction practices.

With this mandate, BCPH envisioned a high-quality, modern alternative to traditional warehouse and big store construction. The building consists of a large open workspace divided into two distinct bays used for manufacturing plus a conference room and office mezzanine in the southwest corner of the plant.

The main motivation for the project's design was the vision that industrial or everyday buildings, which make up a vast amount of our built environment, are just as important and well-considered as our more public and "architectural" buildings.

The main structural elements of the building consist of Douglas fir glulam post-and-beam, with solid wood (SPF), cross-laminated timber (CLT) panel walls, all manufactured in BC. The roof assembly consists of prefabricated '2x12' panels that assisted the erection of the glulam structure by offering permanent bracing for the columns and beams during assembly. The use of these prefabricated structural components allowed for the building's super structure to be set up in eight days, dramatically reducing the on-site construction window.

Three-ply CLT panels were chosen for the wall elements as they provided a robust, finished surface while satisfying wind and seismic considerations. The double bay configuration of the facility created shorter spans enabling the use of simple, cambered glulam beams on glulam columns. Through the use of wood and other ecologically responsible materials, significant environmental and architectural value was achieved for a modest premium compared to conventional construction. Products and materials were chosen for their low environmental impact. BCPH's "wood first" approach resulted in the choice of materials that were sustainable, natural and deconstructible at the end at the end of the building's life. The main building component of the facility is wood or wood byproducts.

The facility is the first of its kind in North America and will assist the company in its promotion of the Passive House standard and sustainable, energy-efficient construction methodologies that use innovative wood-based construction materials.

OWNER	ARCHITECT	STRUCTURAL ENGINEER	GENERAL CONTRACTOR
BC Passive House	Hemsworth Architecture	Equilibrium Consulting Inc.	Durfeld Constructors

PHOTO CREDITS: WESTERN ARCHRIB

Arched Industrial Storage Buildings

Arched storage buildings have a long history with wood construction. This shape of building was used extensively as an agricultural building for its efficiency and availability of material. In the early 1950s and 1960s it was found to be an excellent choice to be used in the storage of potash and other corrosive materials. About 95 per cent of potash is used for fertilizer in agriculture with the remaining five per cent used in commercial and industrial products such as soap.

The arched shape utilizes the naturally high compressive strength of wood to direct and distribute the loads evenly to the foundation. The arch shape can be made to mimic the product pile's angle of repose so that the building does not have large, unused voids. The typical governing loads needing to be taken into account are snow, wind, and if equipped, a tripper gallery as well as product on the tripper gallery. The full analysis is a combination of all four loads including the possibility of a product blockage.

Arched storage buildings generally range in size of up to 197 feet span x 656 in length, however, the longest facility is more than 2,083 feet in length, holding up to 133,000 tons of potash. Each individual arch can be more than 147 feet long, however, arches of this size can be difficult to ship and handle due to their size and weight.

The inherent corrosive resistance of wood in combination with corrosion-resistant connections creates a very durable and economical building where many of these original storage buildings are still in use today.

TIMBER SUPPLIER
Western Archrib

IWS Wood Products Manufacturing Facility

Sheguiandah, ON

IWS Wood Products provides a full range of products and services – from engineering to installation – and specializes in custom heavy timber packages for a variety of structures and applications. Using state-of-the-art CNC equipment and specialized design software, IWS is able to design and fabricate structures of complex geometry.

The company believes that wood construction is the natural choice for environmentally conscious builders because wood from sustainably managed sources is the only major building material that is renewable. Given the company's concern for the environment, it was a foregone conclusion that the company's new fabrication facility would be a wood structure.

The footprint of the new facility is 60' x 120' and the shop floor has clear spans and 22' tall walls. There is also a 25' x 48' open canopy on one side of the building that is used for storage. The wall assembly is comprised of glulam posts and beams with infill 2" x 6" balloon framing, oriented strand board (OSB) on both faces, spray foam insulation, and steel siding.

The roof assembly is comprised of glulam trusses spaced at 12 feet on center, 8' x 24' structural insulated panels, and ice and water shield steel roofing.

"The building and operation is very green," says Ian Whittington, Co-owner of IWS, on the environmental attributes of the facility. "The heating system utilizes an outdoor boiler connected to an in-floor heating system. Off cuts and waste wood generated during production are used for heat in the winter. Wood-framed buildings that are detailed and built correctly are thermally superior to any pre-engineered structural steel building (in Canada, at least) every time."

Although wood structures are somewhat uncommon among industrial buildings, this facility clearly demonstrates that wood solutions are appropriate for all building types. The pursuit of design solutions that incorporate sustainably sourced wood products in new construction helps reduce the carbon footprint of the built environment. Considering the reality of climate change and the growing impact of human development, it is clear that building with wood isn't just a more responsible choice, it is a necessary one. From extraction, through processing, to finished components, wood products have the smallest environmental footprint of any commonly used building material. Using wood in the new ways made possible through advanced manufacturing and computer-aided design has ensured that today's wood buildings are not only sustainable; they're also smarter, stronger and more versatile.

ARCHITECT	STRUCTURAL ENGINEER	TIMBER SUPPLIER
IWS Wood Products Inc.	Whittington Engineering Ltd.	IWS Wood Products Inc.

QUEBEC

PHOTO CREDITS: CHRISTIAN PERREAULT AND GUY TESSIER

Industrial Waste Technology Centre

Rouyn-Noranda, QC

Located in the Abitibi-Témiscamingue region, this research center is a true example of know-how in wood construction. Designed to accommodate research labs specializing in the mining, biomass and environmental engineering industries, this two-story, 28,922-sq.ft. building successfully demonstrates new ways of using local wood resources.

For the designers and the client, the desire to build with wood was asserted from the very beginning. Indeed, because of the center's expertise in reclaiming industrial waste, which includes an important biomass division, using wood as a building material was clearly the only choice. The result is a building with a contemporary design that serves as an example of thorough research in wood structural systems, integrating both a light-frame wood structure and solid timber in a successful and original way.

This is particularly evident in the biomass laboratory which features wide diagonal grid walls made from glulam.

Thanks to the abundant fenestration, passersby can admire this distinctive and contemporary design element from the outside. The realization of these grid walls represented an interesting technical challenge for both the designers and the manufacturers. The very aesthetic result serves to highlight regional industry and know-how. The staircase, also made from glulam, further contributes to the richness of the interior spaces, a rarity in industrial buildings.

In addition to the glulam structure, the light-frame wood roof trusses used in several locations in the building proved to be an economical solution. These were left exposed in the biomass lab workshop where they are used to support the glulam decking, all of which is covered in a uniform translucent stain that highlights the natural beauty of the wood.

Because of its many aesthetic qualities, the Industrial Waste Technology Centre won first place in the 2017 edition of the Cecobois Awards of Excellence in the Industrial Building category.

CLIENT	ARCHITECT	STRUCTURAL ENGINEER	GENERAL CONTRACTOR	GLULAM SUPPLIER
Industrial Waste Technology Centre (Centre technologique des résidus industriels)	TRAME Architecture + Paysage and BGLA architecture + design urbain	Stavibel (SNC Lavalin)	Hardy Construction	Tecolam, Freneco, Charpente 08

ATLANTIC

Atlantic Lobster Pound – Gidney Fisheries Ltd.

Centreville, NS

Gidney Fisheries Ltd. has been located on Digby Neck in Centreville, NS, since 1965. Generations of Gidneys have devoted their lives to the fishing industry and it shows through the passion the company has for its community, employees and products.

Located less than 200 feet from the Bay of Fundy, the original lobster pound still stands today, a testament to the longevity of the Gidney heritage. As a premium live lobster exporter, Gidney Fisheries Ltd. recently refocussed its business direction on providing a superior seafood product to customers around the world. To help drive the business to the next level, a new facility was needed to allow for the planned growth – and it had to be built in rural Nova Scotia where the Gidney family roots first took hold.

In 2015, Gidney Fisheries Ltd. began planning for the construction of a modern seafood processing and holding facility. In consultation with the engineer, it was determined that a wood construction building was considered both economical and flexible, best meeting the immediate and long-term growth plans of the company.

Wood products were used extensively throughout the building. All exterior and interior walls (apart from the interior office walls) are wood-framed with steel-faced insulated panels, providing outstanding R-value (exceeding typical build insulation), durability and an attractive exterior and interior wall. Though the locally sourced wood is rarely seen behind the walls and flooring, it took many iterations on the engineer's table to bring the facility to life. As much as 95% of the structural elements are wood, and even the contemporary office has a rich, gray wood flooring.

Along with the added thermal efficiencies, other energy-saving measures were also adopted into the construction, including 100% LED lighting, Energy Star appliances, variable frequency drives for water circulation pumps, and triple glaze windows. A southern exposure with breathtaking ocean views combined with large office windows provide excellent thermal benefits in the winter and windows that can be opened to offer the option of a fresh ocean breeze for employees three seasons of the year.

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RUITENBERG INC.

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Natural Resources Canada / Ressources naturelles Canada

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BSLC

CertainTeed SAINT-GOBAIN

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LP

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Guardian Structures

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