

# **Ameublements Tanguay Furniture Retail Outlet in Trois-Rivières, Quebec (Canada)**

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## 1. A new era of retail space construction with wood in Quebec

The construction market for retail buildings in Quebec has seen major changes over the past ten years with the arrival of engineered wood structures. These structures have revolutionized traditional steel constructions.

### 1.1. A sector traditionally dominated by steel design

Quebec's commercial building sector is dominated by the province's many steel structure manufacturers.

Steel structural solutions are ubiquitous, and familiar to developers and clients alike.



Figure 1: Traditional North American steel retail construction

As a result, gaining market share in this sector is a major challenge for the wood industry. The solution? To consistently offer new structural solutions that are optimized on both a technical and budgetary level to compete in a cutthroat market.

### 1.2. Groupe BMR: A pioneer in large retail outlets built with wood

In 2012, Groupe BMR member company Groupe Yves Gagnon became one of the first retailers to choose wood when building new locations.

The company was motivated by a desire to build more eco-friendly stores by choosing regional materials.

Using wood—the material their business was built on—for the structure was a natural choice for the group's owners.

The opportunity to offer its customers a new atmosphere and create a more pleasant workplace for employees convinced Groupe BMR to incorporate wood structures in most of its new locations. To do so, it worked closely with Nordic Structures.

Building in an eco-friendly way was a strategic choice that paid off for the company. Sales grew from the opening of the first new locations onwards. The new stores became extremely successful, especially with female customers.

Naturally, Groupe BMR chose wood again for eight new stores built between 2012 and 2015.



Figure 2: The first Groupe BMR locations built with wood structures in Quebec

## 2. Ameublements Tanguay project, Trois-Rivières, Quebec

### 2.1. The largest retail outlet in North America with an engineered wood structure

Ameublements Tanguay Trois-Rivières is the latest and largest location of 55-year-old furniture company Ameublements Tanguay. It opened in late 2016.

Located in Trois-Rivières' District 55 complex, the building boasts a total square footage of approximately 7,500 m<sup>2</sup>.



Figure 3: Main facade of the Trois-Rivières Ameublements Tanguay store

### 2.2. Building volumes

The building, which was designed by architecture firm Coarchitecture, is separated into three main areas: two showrooms (furniture and appliances) and a warehouse and service area. In addition to the three main volumes, the building features a skylight that runs along the main passageway and a double-height glass section at the entrance to the store.

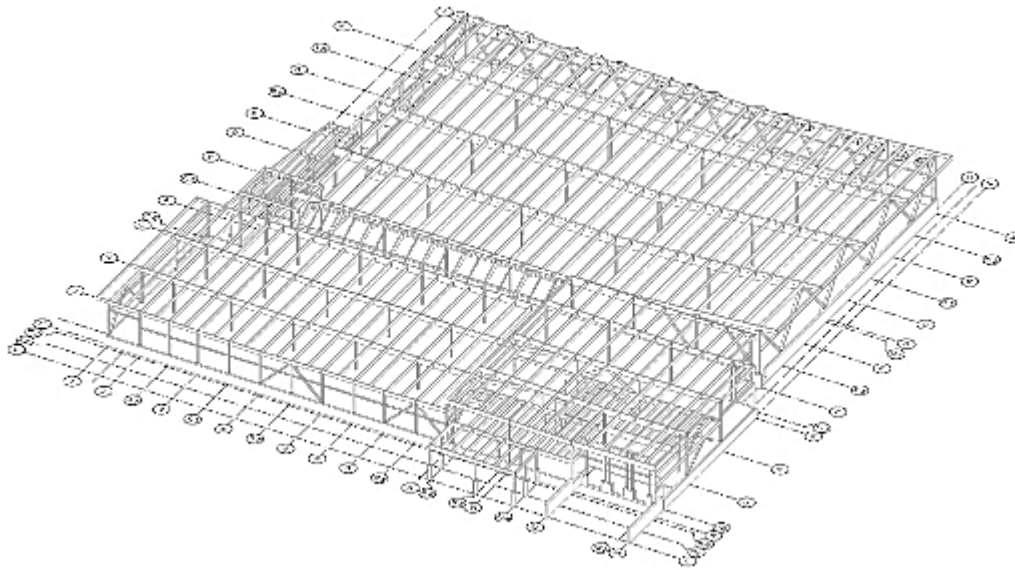


Figure 4: Isometric view of the wood structure

## 2.3. Structural concept

### 2.3.1. Showroom areas

The building's two large showrooms have beam areas measuring 15 m x 12.5 m and 9.5 m x 10 m.

The structure employs a glued-laminated timber (glulam) beam-column system, with purlins at a maximum interaxial distance of 2.5 m. The purlins support 44 mm-thick glulam decking, which in turn supports an insulating damp-proof course.

The primary beams for the largest spans (15 m) are 1,473 mm deep.



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Figure 5: Showroom

The main showroom's structural system is unique due to its V-shaped gable columns and facade columns, which give the structure the stability to resist lateral loads. They also lend a pleasing esthetic to the glass facades, which were designed by the building's architects.



Figure 6: V-shaped columns on the building's facades

### 2.3.2. Atrium

A skylight runs along the main passageway connecting the two showrooms, creating a unique architectural feature.

The asymmetrical structure of this atrium was achieved using dual-slope beams.

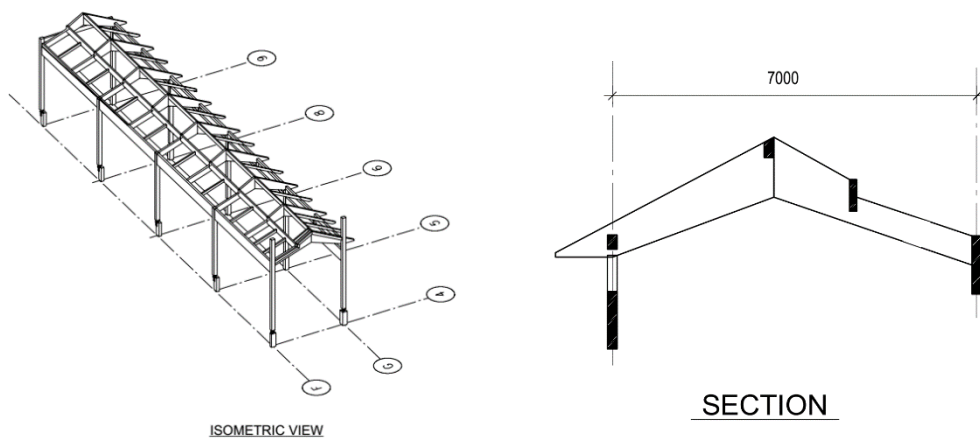


Figure 7: Cross-sections and photos of the main passageway

## 2.4. Manufacturing

The entire wood structure and the connectors needed for its assembly were manufactured by Chantiers Chibougamau, Nordic Structures' parent company and production plant. Chantiers Chibougamau is located in Chibougamau, a community in Northern Quebec.



Figure 8: Location and aerial view of the production site

The species used to manufacture the glulam structure was black spruce from the Nord-du-Québec region. It is an unusually dense species due to its slow growth rate.

In the late 1990s, the company developed its unique "enviro-lam" process, which allows for the incorporation of small wood laminations (25 mm x 50 mm) into the glulam manufacturing process. Using the raw material in this way gives Nordic Lam glulam advantageous mechanical properties, making it a very high-quality material suitable for use in engineered wood structures.



Figure 9: Nordic Lam glued-laminated timber

All machining was done in the plant using numerically controlled machines. The product therefore arrived ready to assemble on the building site, which made for a shorter erection period. The structure went up extremely quickly despite the winter conditions.



Figure 10: Numerically controlled machining centres

Approximately 950 m<sup>3</sup> of FSC-certified glulam was used for the structural members and roof slabs.

### 3. Conclusion

The Ameublements Tanguay project will certainly help the engineered wood industry reach new heights in Quebec's competitive retail construction market.

Close collaboration with the project team from the design stage onwards facilitated the building's optimization, demonstrating that this type of structure can accommodate budgetary constraints and still result in a project of very high architectural quality.

The store's size and strategic location next to a highway gives it enviable visibility. Ideally, its beauty and technical features will encourage more developers, who are often hesitant to work with an unfamiliar material, to opt for wood.

### 4. References

- [1] *Construire en Bois* newsletter, Vol. 8, No. 2, November 2016, Cecobois, Quebec City.
- [2] *Ameublements Tanguay de Trois-Rivières* case study, November 2017, Cecobois, Quebec City.