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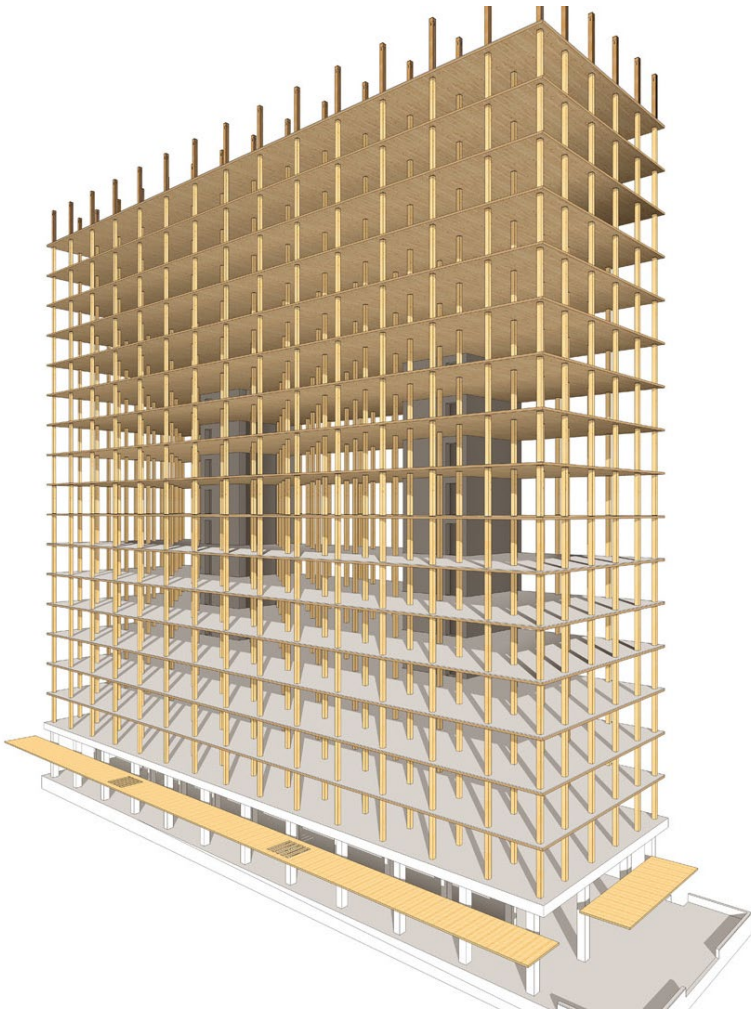
A LOOK AT THE 18 STOREY TALL WOOD BUILDING

UBC STUDENT RESIDENCE AT BROCK COMMONS PHASE 1

Owner / Developer | **The University of British Columbia**
Architect | **Acton Ostry Architects**
Building Code / Fire Engineering | **GHL Consultants**
Structural engineer | **Fast + Epp**



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After several months of planning and intensive design work, GHL is pleased to share our perspective of the recently announced UBC 18 storey Tall Wood building, officially known as Brock Commons Phase 1.

ARCHITECTURAL DESIGN

The UBC Tall Wood building is designed using a hybrid timber-concrete structure. When finished, the building is intended to provide the much needed student residence beds to address a current 3500 wait list for university housing.

According to Acton Ostry, as part of the design process, the potential use of a hybrid mass wood and concrete structure was investigated to assess the technical and economic viability for the project to demonstrate the applicability of wood in BC's development and construction industries. The Project Team was able to demonstrate that a project utilizing a hybrid mass wood and concrete structure could be constructed for a cost similar to that for a building using a typical concrete or steel structure. Advances in wood technology and manufacturing make tall wood buildings not only possible but also safe and cost effective, while providing a way to lessen the carbon footprint of the built environment.

PROJECT DESCRIPTION

The UBC Tall Wood building is 18 storeys with a physical height of 53m. The typical building footprint is 15m × 56m with a building area of 780m^2. The structure is a hybrid system comprised of 17 storeys of mass wood construction located above a one storey base of concrete construction. There are two 18 storey concrete cores containing exit stairs and elevators. The principal use of the project will be for the housing of upper year and graduate students. The building is a Group C (residential) major occupancy with a student lounge located on the 18th floor. The project includes Group A-2 (assembly) subsidiary occupancy uses such as study and social spaces located on the ground floor.

FIRE SAFETY DESIGN

The UBC Tall Wood building has been designed with a mass timber structure that is fully encapsulated and protected by a sprinkler system with a backup water supply. Given this is a unique project that is the first of its kind in Canada, an intentionally conservative design approach was used. It is intended that the project is equally as safe as that for high rise buildings that uses a concrete or steel structure. The fire safety design has undergone a peer-review process involving a panel of leading fire safety experts, scientists, authorities and firefighters.

Fire safety measures that have been incorporated into the design are intended to achieve three key objectives: life safety of the occupants, safety of the firefighters, and prevention of structural failure in fire.

SSR PROCESS

Because the building's construction is unique and is considered to be outside the boundary of the current BC Building Code, a site specific regulation (SSR) was sought pursuant to the Building Act. The Act allows the provincial regulatory body to review and seek experts in the field to assist where needed of unique projects in the province. In this case, the province sought expert advice from a panel of structural and a panel of fire experts to review the structural and fire safety designs of the building. From GHL's perspective, the SSR process is no different than a typical alternative solution except that due to the nature of the variance from the prescriptive code, the review process involved a greater number of stakeholders.

FACTS + FIGURES

Volume of CLT panels	1973m^3
No. of CLT panels	464 pieces
Weight of CLT panels	954 tonnes
Volume of glulam columns	260m^3
No. of glulam columns	1,298 pieces
Weight saving due to wood structure over concrete	7,648 tonnes
Schedule saving due to faster erection of wood	2 months

CLT floor slab with glulam columns and steel connector

partial encapsulation during construction

completed construction

OUR EXPERTISE

GHL has been involved in a number of significant large timber building projects in Canada where alternative solutions and performance-based fire engineering analysis were carried out to ascertain their safety and compliance with the code. Our expertise with mass timber structure is supplemented by our continued involvement with key provincial and national organizations, including FPInnovations and NRC, and our participation on the CSA O86 subcommittee for the design of timber structures for fire. Based on our experience, expertise, and knowledge of the Canadian building codes, we can provide building code consulting services and performance-based alternative solutions to enable greater use of wood in buildings.

The information in this letter is for discussion purposes only. Refer to applicable Building Codes and Fire Codes for actual requirements. The designer should always check with the AHJ for local policies and interpretations regarding the foregoing.

ABOUT GHL CONSULTANTS LTD

GHL is a team of fire engineers and building code professionals who have extensive experience and advanced training in fire safety codes and fire engineering. With expert knowledge in fire safety and an established working relationship with many authorities having jurisdiction, we are capable of solving a wide variety of fire engineering challenges that arise from the prescriptive codes. Our fire science background provides us with a strong capability in fire modelling and evacuation/egress modelling. With a dedicated team of fire modelling engineers, GHL can advise clients when fire modelling adds value to a project and when fire modelling analysis is required. For further information, visit our website at www.ghl.ca.