FAST+EPP HOME OFFICE

Vancouver | BC | Canada

Fast + Epp

Photo Credit: Mathias Fast

(Cover Page, Credit: Mathias Fast)

Project Summary

Fast + Epp's four-storey home office building embraces design elegance and curiosity - traits the firm has become known for. The office serves as a 'living laboratory' with new ideas and technologies being tested both during construction and throughout the life of the building. With an emphasis on promoting employee wellness and productivity, the building combines the latest in sustainable design strategies while taking full advantage of the spectacular mountain views to the north.

INNOVATION

Fast + Epp's home office building uses hybrid mass timber and steel as the structure's fundamental building block to demonstrate material efficiency, cost-effectiveness, and sustainable construction.

Tectonus Technology

The lateral design of the four-storey structure utilizes Tectonus devices installed at the base of CLT shear walls and within the steel braced frames – a first for North America. These devices act as shock absorbers for the building during an earthquake, providing energy dissipation and damping through the earthquake cycles, with the ability to snap back to its original position once earthquake shaking ends.

The Tectonus connectors undergo no damage, a feature that will allow immediate return to occupancy after a significant earthquake, without facing uncertain delays that would be expected with a more conventional system.

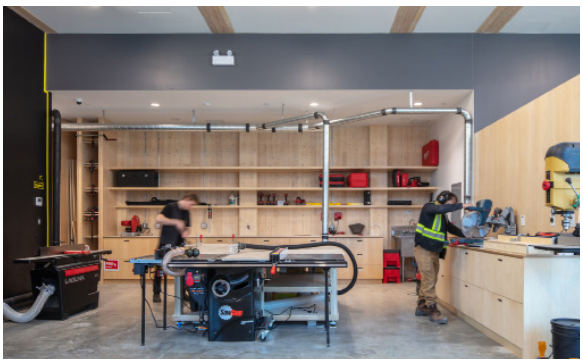
View Glass

View glass not only eliminates the need for blinds and their associated cleaning and maintenance, but it also keeps the interior aesthetic tidy to showcase the gorgeous wood structure. As the sun exposure changes throughout the day, the proprietary View Intelligence control software dynamically optimizes the tint of each window using a low voltage current. The transition between the varying tint levels enables these windows to control glare and solar heat gain while maximizing natural light and views. To further maximize light and views to the exterior, the glulam beams are supported on the west side by slender steel HSS columns.

Concept Lab Space

Located on the ground floor and half of the second floor, Concept Lab is a research and development space focused on advancing structural design, discovering new ways to build, and propelling architectural imagination. Continuing a legacy of innovation at Fast + Epp, the space provides design professionals, academia, industry associations, and innovators alike the ability to enliven their design ideas.

Concept Lab provides access for Fast + Epp staff to brainstorm and develop concepts, a full shop to fabricate models, prototypes, and mock-ups, a 100,000lb loading frame for structural testing, and digital suites to develop design visualizations, software, and design tools.



COMPLEXITY

While having to shoehorn 1,400m2 of permissible area into a tight site was not without significant planning challenges, the design collaboration between Fast + Epp and f2a Architecture yielded a four-storey building with generous daylighting at the north, south, and west sides, ample balcony space arising from setbacks at the north and south end of the 4th floor, and a 2-storey central atrium connecting the 3rd and 4th floors all founded on a single-storey underground parking level.

Many prefabricated timber and hybrid timber-steel panel options were considered for the floor construction, however, in this instance, simplicity won out over complexity and the choice was made to use glue-laminated timber beams clear-spanning 12m at 3m spacing supporting cross-laminated timber floor panels. In the spirit of the building becoming a living laboratory, glulam beams of 608mm depth were designed to satisfy strength requirements while pushing the limits on vibration performance. An extensive vibration testing program using accelerometers was established to test the impact of various building elements on the performance of mass timber floors.

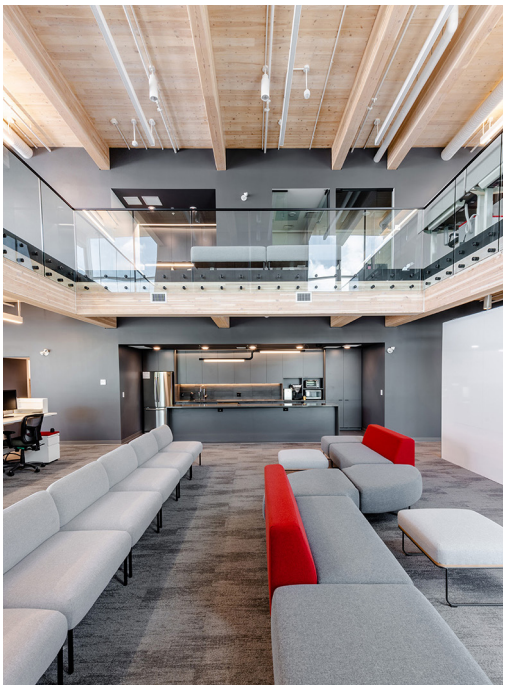
The floor structure consists of 3-ply CLT panels, 105mm thickness at floor levels and 87mm thickness at the roof. The timber beam & panel ceiling remains exposed over the majority of the floor with services (mechanical, electrical, sprinkler) carefully located to ensure a clean and tidy expression of the building systems.

SOCIAL/ECONOMIC BENEFITS

The design of the Fast + Epp office is a direct reflection of who we are as engineers and embodies the notions of innovative integrated systems and biophilic design – all coming together in harmony for a truly holistic design.

The well-being and productivity of staff are at the forefront of the building's design – generous glazing allows for ample daylighting of the mass timber interiors, and smart glass technology automatically adjusts the tint level eliminating the need for any window blinds. With this technology, the building has a reduced energy consumption level, and an improved ambiance for employees.

Schedule savings were quickly realized once timber started arriving on-site with the entire superstructure being erected by Seagate Mass Timber within a short four-week span on a very constricted site.



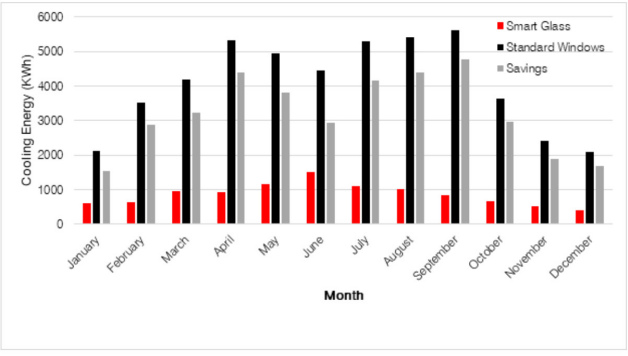
ENVIRONMENT BENEFITS

Cross-laminated timber (CLT) is utilized extensively throughout the building for the floor plates, stairwells, and elevator cores, as well as the demising firewall. Wood across Western Canada was chosen specifically for its embodied carbon attributes. The comparison of Global Warming Potential (GWP) for the different assembly groups indicates reductions across all elements for a timber building, with the most significant savings realized in the walls and floors. In total, the timber superstructure design produces 47% of the CO_2 emissions compared to concrete.

The structure tells one part of the carbon story, the rest is told by operational carbon. Floor-to-ceiling glazing is a building feature that maximizes views and daylighting. To reduce glare and to control temperatures for occupants close to the building perimeter, the options are to introduce solid wall elements or shading. The choice was made to use electrochromic glass in a curtain wall assembly to get the best of both worlds. As the sun exposure changes throughout the day, the proprietary View Intelligence control software dynamically optimizes the tint of each window using a low voltage current. The resulting energy savings using dynamic tint is illustrated in the figure below.

The annual energy savings are expected to be in the order of $5,000CAD.

The View Glass will intelligently adjust tint throughout the day to optimize employee comfort and working conditions. Combined with natural ventilation, the dynamic glass enabled a large reduction in cooling requirements, reducing overall energy and maintenance costs.



MEETING CLIENT'S NEEDS

This project represents a new approach to the design of commercial buildings. It looks at the well-being of employees and the ability to provide a social environment that encourages creative thinking and productive engagement. The office is also home to our research and development hub, Concept Lab. Altogether, the building presents a key opportunity to showcase and test contemporary hybrid mass timber office construction coupled with a state-of-the-art, seismic dampening technology.

Our hope is that our new home in the heart of Vancouver will serve as an inspirational place where engineering design and idea generation flourishes and the space becomes a hub of activity for our industry. A balance between structural simplicity, innovative technology and the warmth of exposed wood have made this building a special place with an exciting future as this living laboratory continues to grow.