

STRUCTURECRAFT FACILITY

LOCATION

Abbotsford, British Columbia

SIZE

4,645 m²

COMPLETION

November 2017

ARCHITECTS

Keystone Architecture

STRUCTURAL ENGINEER

StructureCraft Builders Inc.

GENERAL CONTRACTOR

StructureCraft Builders Inc.

**ENGINEERED WOOD
SUPPLIER/FABRICATOR**

StructureCraft Builders Inc.

PROJECT OWNER

StructureCraft Builders Inc.

PROJECT OVERVIEW

StructureCraft's new manufacturing facility demonstrates the possibilities for using a wood superstructure to construct an industrial building. Using engineered wood in prefabricated wall and roof panels, the building was erected in just five days. Traditionally, these types of industrial buildings have been built with tilt-up concrete walls and steel roof structures, but StructureCraft, a mass timber design and production company, took the opportunity to design a new industrial building prototype out of wood for their own manufacturing plant. The new facility makes them the first North American company to manufacture dowel laminated timber (DLT), and the project showcases the ability to efficiently and economically construct industrial buildings from wood.

The building, which includes 4,000 square metres of manufacturing and about 650 square metres of office space, was designed and built as a demountable structure, with modular wood wall and roof panels. Modular configuration

enabled the almost unheard-of construction speed of five days; the erection of the timber superstructure commenced on a Monday, and the crew had the entire building, walls and roof, erected by Friday evening of the same week. The building was also cost competitive, costing about the same as a concrete tilt-up building but fully insulated, and with the aesthetics of exposed wood, providing a more pleasing work environment than a typical warehouse, further contributing to the overall health and well-being of the workforce.

The strength of wood is demonstrated by the fact that crane rails supporting the heavy-duty manufacturing equipment are directly attached to the wood columns and walls leaving no need to add a steel support structure. Since the demountable wood structure is panelized and screwed into place, it is also possible to take the building apart and extend it to accommodate future facility expansion.



Photo courtesy of StructureCraft Builders.

“Our team aimed to develop a signature structure that would expand on what’s possible with wood. Not only was a cost-effective industrial building quickly and efficiently built, but this project showcases the advantages of building with engineered wood for the industrial buildings of tomorrow.”

Lucas Epp, Engineering Manager, StructureCraft

WOOD USE

StructureCraft used much of their own engineered wood products, manufactured and/or fabricated at their former plant in Delta for this project. Glulam beams and columns, supplied by others, form the structural frame of the new facility, and special architectural quality nail laminated timber (NLT) panels were used for the roof of the office portion of the building. They also used plywood sheathed NLT panels for the primary shear walls.

For the manufacturing facility, the main roof structure was framed by glulam beams with purlins and layers of plywood on top to form panels 3.7 metres wide by 19 metres long. To manage lateral loads like wind, several layers of plywood were added to the roof. The multiple layers of plywood creating a large structural diaphragm that distributes

lateral loads to the four exterior walls and eliminates the need for any internal bracing in the building.

To form the fully-insulated, prefabricated wall panels, laminated strand lumber was used for the wall studs, spaced 0.6 metres on center. After adding insulation, plywood was fastened to both sides of the tall wall studs to create wall panels 3.7 metres wide by 10 metres tall. These wall panels were lifted and then dropped into place by crane on-site. The office floors and roof were built with NLT incorporating a special profile in each board containing acoustically absorptive material. The NLT used on the office built by hand, was created to showcase the possibilities of the similar but more advanced, Dowel Laminated Timber (DLT) product to be machine manufactured in the new plant.



Photo courtesy of StructureCraft Builders.

ESTIMATED ENVIRONMENTAL IMPACT OF WOOD USE

<p>V Volume of wood products used: 552 cubic meters</p>	<p>GHG EMISSIONS ARE EQUIVALENT TO:</p>
<p>T U.S. and Canadian forests grow this much wood in: 2 minutes</p>	<p>250 cars off the road for a year</p>
<p>C Carbon stored in the wood: 501 metric tons of CO₂</p>	<p>Energy to operate 125 homes for a year</p>
<p>CO Avoided greenhouse gas emissions: 682 metric tons of CO₂</p>	<p><small>*Estimated by the Wood Carbon Calculator for Buildings, cwc.ca/carboncalculator.</small></p>
<p>✓ Total potential carbon benefit: 1,183 metric tons of CO₂</p>	<p><small>*CO₂ refers to CO₂ equivalent.</small></p>

FOR MORE INFORMATION

This profile is published by Forestry Innovation Investment, the Government of British Columbia’s market development agency for forest products.

For more examples of innovative wood building projects throughout British Columbia, visit:

naturallywood.com

The wood grain featured in this profile is lodgepole pine.