

# BELLA BELLA STAFF HOUSING

**LOCATION**

Bella Bella, British Columbia

**SIZE**

500 m<sup>2</sup> (6 units)

**COMPLETION**

October 2015

**ARCHITECTS**

Mobius Architecture Inc.

**STRUCTURAL**

CanStruct Engineering Group

**GENERAL CONTRACTOR**

Spani Developments Ltd.

**MODULE FABRICATOR**

Metric Modular

**PROJECT OWNER**

Vancouver Coastal Health

## PROJECT OVERVIEW

The speed afforded by modular wood-framed construction allowed Vancouver Coastal Health (VCH) to construct new much-needed staff housing in the remote community of Bella Bella efficiently and cost-effectively.

Conventional site-built construction would be expensive for Bella Bella's remote location, due to the challenge of finding skilled labour in the area and the expense of shipping building materials. Bella Bella also has a limited weather window, and construction needed to be complete before winter hit the rugged coastal area. Their decision to use wood-framed modular construction ensured that the new units would be in place quickly.

VCH had also been wanting to change performance requirements for new facilities from LEED to Passive House, and the Bella Bella project gave them the opportunity to do so while lowering operating energy costs. As a result, the project

became the first modular Passive House-certified project in British Columbia. The resulting energy-efficient units continue to save on utility costs, even in Bella Bella's cold climate.

After being constructed at Britco Construction's quality-controlled facility in Agassiz, the twelve modules were trucked to Maple Ridge, where they were loaded onto barges and then shipped down the Fraser River and up the coast. Once in Bella Bella, they were erected on site, forming six two-story, two-bedroom units. Using an approach known as volumetric prefabrication, the fully-assembled wood-framed modules were transported with insulation, plumbing and cabinetry already installed. Modules were tested for compliance with Passive House standards as they were completed in the factory, and again after they were erected on-site. A team of 13 workers commenced site work in March and hospital staff moved into their new homes in October. Production of the modules themselves required just 45 days.



Photo courtesy of Metric Modular

“For this project, we needed to reduce construction and energy costs, while maintaining a high level of quality. The Passive House standard and off-site prefab wood construction was the only choice for us and it paid off. We finished the project on time and on budget.”

**Brett Crawley**, Facilities Management Project Leader,  
Vancouver Coastal Health

## WOOD USE

Bella Bella’s 12 modular units, 4.25 metres wide x 9.75 metres long x 4.75 metres tall each, used wood throughout. Walls and floors were constructed with standard spruce-pine-fir (SPF) dimension lumber, while structural plywood and oriented strand board were used for the roof and wall sheathing as well as for the subfloor. Built-up SPF dimension lumber was used for structural headers, steel-plated wood frame SPF lumber trusses framed the roof, and pressure-treated SPF lumber was applied for decking and exterior framing. Cedar was used for the exposed post-and-beams on the rear decks.

Exterior walls were constructed with 2x6 dimension lumber studs to

accommodate the extra insulation needed for Passive House compliance. Base units had a double floor frame to allow for mechanicals and to also meet the higher insulation requirements. Additional insulation was installed on the outside of the sheathing before the exterior siding was added for improved energy performance.

Wood’s lower thermal conductivity was a key factor in helping VCH achieve Passive House standards. While thermal bridging reduces envelope insulation performance for all building components, wood is less thermally conductive than steel framing, making it a natural choice for improving energy efficiency.



Photo courtesy of Metric Modular

## ESTIMATED ENVIRONMENTAL IMPACT OF WOOD USE

<b>V</b>	Volume of wood products used: 175 cubic meters	<b>GHG EMISSIONS ARE EQUIVALENT TO:</b>
	U.S. and Canadian forests grow this much wood in: <b>29 seconds</b>	95 cars off the road for a year
<b>C</b>	Carbon stored in the wood: 145 metric tons of CO <sub>2</sub>	Energy to operate <b>48</b> homes for a year
	Avoided greenhouse gas emissions: 305 metric tons of CO <sub>2</sub>	<small>*Estimated by the Wood Carbon Calculator for Buildings, cwc.ca/carboncalculator.</small>
	Total potential carbon benefit: 450 metric tons of CO <sub>2</sub>	<small>*CO<sub>2</sub> refers to CO<sub>2</sub> equivalent.</small>

## FOR MORE INFORMATION

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

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