OKANAGAN COLLEGE CHILD CARE CENTRE

LOCATION
Penticton, British Columbia

SIZE
410 m²

COMPLETION
2017

ARCHITECT
Landform Architecture + Design Build

STRUCTURAL ENGINEER
Aspect Structural Engineers

GENERAL CONTRACTOR
Ritchie Contracting and Design Ltd.

ENGINEERED WOOD SUPPLIER
Boundary Truss Inc.

PROJECT OWNER
Okanagan College

Project Overview

At its very heart, the Okanagan College Child Care Centre is a project dedicated to sustainability. The first institutional building in Canada to meet stringent Passive House certification requirements, this wood-framed structure uses just one-quarter of the energy that a comparable commercial building would require.

While the design team considered other structural materials, they chose wood because it was a sustainable, cost-effective building material that could be installed quickly. Okanagan College administrators wanted to show that Passive House compliance was possible within the institutional building realm.

The Centre provides care for children of faculty, students and the local community. This building also has provided a number of unique learning opportunities across the College.

Students from the Sustainable Construction Management Technology program were involved during design and construction of the Centre, gaining first-hand experience in Passive House technology. Carpentry student's from the Trade and Apprenticeship program were able to observe the building process. The Centre also contains a classroom with one-way mirrors that allow Early Childhood Education students to observe childcare methods in action.

In addition to the high performance design and construction of the building, the Centre provides a warm, natural environment for staff and children.

Photo courtesy of John Adrian

"Wood fit well with our philosophy on this project that less is more. It's tempting to want to try something new, but we needed to build this facility quick; we didn't have time to experiment. Part of the benefit of using wood in a high-performance structure like this is that you're working with something that's familiar, easy to get and locally-available; our tradespeople know how to work with wood."

Nicholas Hill
President and Owner/General Manager
Ritchie Contracting and Design Ltd.

Photo courtesy of John Adrian

Wood Use

Okanagan College had a tight budget and schedule constraints. The design-build team completed the project in just 10 months.

This structure was framed with double-stud exterior walls, wood trusses, cross-laminated timber (CLT) for the entrance canopy and laminated veneer lumber (LVL) for window and door headers. Inside, they used birch wall paneling in the central corridor; interior door and window frames were Douglas-fir. All forest products were harvested and milled within the Okanagan region.

The double-stud walls were framed using 2x4 spruce-pine-fir (SPF) dimension lumber, then sheathed with plywood on both sides. Rather than relying on building paper to provide airtightness, they used high-performance adhesive tape to seal the plywood joints inside and out. Cellulose insulation was blown in between the 51-cm-thick stud walls; the thickness was chosen to achieve their desired R-value R-72 for Passive House certification. Because the two walls were tied together only by 3/4-inch plywood top and bottom plates, thermal bridging was negligible.

Both pitched- and parallel-chord plated wood trusses were used for the roof. As with the walls, the wood trusses provided the depth needed to get high R-84 insulation values. Because of the vaulted spaces, they installed a steel moment frame for seismic and to maintain shear resistance.

Wood met the team's goals in terms of insulation values, low cost and speed of construction. Wood's machinability was also important in their ability to build an airtight structure. Products like plated wood trusses were easy and efficient to engineer, fabricate and install.

The Okanagan College Child Care Centre taught all involved that standard light-frame wood construction can be used to build high-performing, functional yet beautiful structures.

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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