CORDOVA BAY ELEMENTARY SCHOOL

LOCATION
District of Saanich, Victoria, BC

SIZE
1,533 m^2

COMPLETION
2016

ARCHITECT
Iredale Architecture

STRUCTURAL ENGINEER
Herold Engineering Limited

CONSTRUCTION MANAGER
Durwest Construction Management Inc.

WOOD FABRICATOR/INSTALLER
StructureCraft Builders Inc.

PROJECT OWNER
B.C. School District #63

Project Overview

In 2008, British Columbia launched a process to assess school earthquake preparedness. Cordova Bay Elementary School was originally constructed in 1945 using light-frame wood. The one-storey school had been renovated over the years with additions that used unreinforced concrete masonry walls. The structure needed significant seismic upgrades, but instead of remodeling, the School District demolished and replaced select portions of the school using a cost-effective combination of nail laminated timber (NLT) roof panels and cross laminated timber (CLT) wall panels.

While they initially intended to use CLT for both walls and roof, the School District and the design team wanted to take full advantage of their mass timber product options, and so worked together to explore alternatives. They decided to combine CLT with NLT, which made more efficient, cost-effective use of mass timber and saved the District money.

The combination of the two mass timber products resulted in a structure which excels in stability and structural efficiency while providing the warm aesthetic the school wanted—all at a cost which fit their budget. The newly constructed areas include a four-classroom wing, library commons and computer lab, seminar rooms and multipurpose room. A linking corridor provides access to a new outdoor teaching space developed within a reinvigorated courtyard.

With about 250 students, Cordova Bay Elementary was the first composite NLT and CLT school built on Vancouver Island. The project was significant in its confirmation that mass timber panel systems can provide a cost competitive, code-compliant solution for safe design in high seismic zones.

Photo courtesy of Krista Jahnke Photography

"When designing schools, you must be highly conscious of the overall learning environment, safety and the bottom line – you have to make it all work. The combined use of CLT and NLT here met budget and seismic requirements, provided acoustic benefits, and supported quick and efficient construction. An added feature is that we love how the timber elements contribute to the overall aesthetic of the Project."

***Michael van Bakel**, Co-Principal, Iredale Architecture*

Wood Use

The decision to use NLT roof panels resulted in a cost savings. NLT is more structurally efficient for use spanning in one direction and required less timber by volume than CLT. Made using 2x8 dimension lumber set on edge and then fastened with long nails, the school's NLT roof panels span more than 8 metres. As NLT has the narrow edge of the lumber visible, the panels provide a more textured appearance compared with the flat surface of CLT. The texture also helps manage sound, which is important in a busy school environment.

NLT roof panels were set atop a glue laminated timber (glulam) post and beam structure framed with CLT walls. Plywood was pre-installed to the top of the NLT during fabrication; the plywood transferred diaphragm forces to the structure below and stabilized the NLT panels for erection. A bituminous vapour barrier was applied to the plywood to mitigate rain issues. Five-ply CLT panels framed the load-bearing shear walls and dimension lumber was used for the non-load-bearing walls.

The use of wood provided many advantages. Wood's lighter weight provides a direct correlation to seismic performance, improving safety for students and staff. The aesthetics of the exposed wood structure was also a reason architects chose wood. The CLT and NLT panels could be left exposed to the interior, adding warmth to the school environment. Speed of construction was another benefit. The mass timber walls and roof panels were installed in two phases for a total of 10 weeks, and the project was completed in time for the start of the school year.

The wood grain featured in this profile is western red cedar.

Photos courtesy of Krista Jahnke Photography

ESTIMATED ENVIRONMENTAL IMPACT OF WOOD USE

- Volume of wood products used: **312 cubic meters**
- U.S. and Canadian forests grow this much wood in: **1 minute**
- Carbon stored in the wood: **244 metric tons of CO_2**
- Avoided greenhouse gas emissions: **94 metric tons of CO_2**
- Total potential carbon benefit: **338 metric tons of CO_2**

GHG EMISSIONS ARE EQUIVALENT TO:

- **72** cars off the road for a year
- Energy to operate **36** homes for a year

**Estimated by the Wood Carbon Calculator for Buildings, cwc.ca/carboncalculator.*

**CO2 refers to CO2 equivalent.*

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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naturallywood.com