# QUALICUM BEACH FIRE HALL

**LOCATION**
Qualicum Beach, British Columbia

**SIZE**
1,674 m²

**COMPLETION**
2015

**ARCHITECT**
Johnson Davidson Architecture + Planning Inc.

**STRUCTURAL ENGINEER**
Herold Engineering Ltd.

**GENERAL CONTRACTOR**
Windley Contracting Ltd.

**ENGINEERED WOOD FABRICATOR**
Brisco Manufacturing Ltd.

**PROJECT OWNER**
Town of Qualicum Beach

## Project Overview

The town of Qualicum Beach is situated on the northeast coast of Vancouver Island at the foot of Mount Arrowsmith. Together with neighbouring communities, this fast-growing region has a population of around 45,000. Forestry has always been important to the local economy, and also supports jobs in the nearby town of Parksville.

The new fire hall serves as the headquarters of the Qualicum Beach Fire Department and is designed to meet the needs of both career and volunteer personnel. The building includes four tandem drive-through bays, with related apparatus storage, decontamination area, hose tower, workshop and locker and change facilities. The remainder of the hall includes a reception area, meeting room, administrative offices and workstations, fitness/exercise room, day room, kitchen and dining room. Lastly, there is a fire department training room large enough to divide successfully into two functional rooms to be used as an integral part of the training system for the fire hall and the backup Emergency Operations Centre.

The design of the project encompassed many sustainable design strategies and offered a strong business case and demonstrable social advantages; all of which made it eligible for substantial grant and low-interest loan funding from the Federation of Canadian Municipalities Green Municipal Fund.

Among these strategies was the use of 85% local timber for the primary structure of the apparatus bays and as a cladding material. Regional sourcing benefits the local economy and, being a natural insulator, wood increases the thermal performance of the building envelope and reduces operating energy, an important consideration for the municipality which both owns and operates the building.


*Photo credit: Bob Matheson Architectural Photographer*

*"The use of solid mass timber panels is an effective option for institutional buildings considering sustainability and performance. Speed of construction is also advanced through the use of prefabricated wood panels. With the Qualicum Beach Fire Hall, the roof panels were erected in only seven days allowing for the roof membrane to be installed much earlier in the construction process."*

***Kimberly Johnston**, Principal*
*Johnston Davidson Architecture + Planning Inc.*

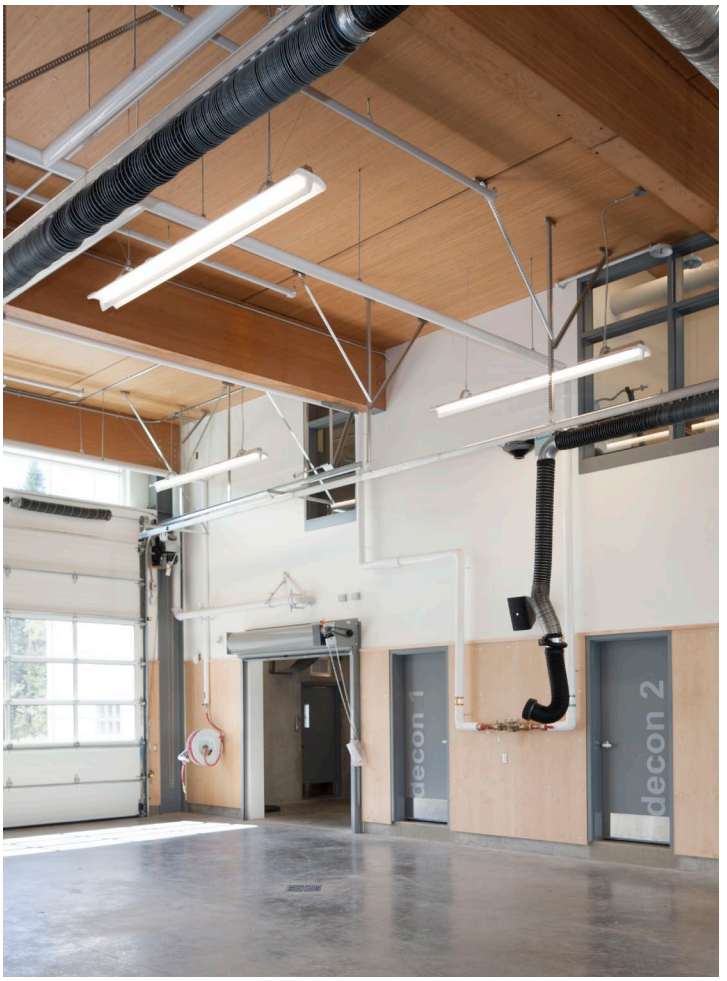


*Photo credit: Bob Matheson Architectural Photographer*

## Wood Use

Designed to post-disaster standards, which require the structure to resist seismic loads 50% higher than those for regular buildings, Qualicum Beach Fire Hall was constructed using a concrete slab on grade, with dimensional lumber for its wood-frame vertical structure and laminated veneer lumber panels (LVL) for its upper floor and roof systems.

This integration of LVL panels for the roof of the apparatus bays, training room and suppression crew quarters is an innovation that brought multiple benefits to the project. From the point of view of embodied and operating energy, wood has a lower carbon footprint compared to concrete or steel equivalents. The low air permeance of the LVL panels also improves energy efficiency, reducing heat loss through the building envelope.

The LVL panels are only one-sixth of the weight of concrete equivalents, and are one-third thinner. In addition, the attractive panels can be left exposed, eliminating the need for a suspended ceiling. These factors make handling and installation easier and quicker, and reduce the required height of the building, which in turn reduces the surface area of the building envelope and the interior volume that must be conditioned.

With a shorter time required for shop drawings, it is estimated that the use of LVL on this project reduced the overall construction time for the structure by 65% compared to a conventional steel or concrete system. Furthermore, the use of wood, a familiar local material, provided the greatest opportunity to engage local labour in the project, maximizing the economic and social benefits to the community.

*The wood grain featured in this profile is Douglas fir.*

## ESTIMATED ENVIRONMENTAL IMPACT OF WOOD USE

- Volume of wood products used: **509 cubic metres**
- U.S. and Canadian forests grow this much wood in: **1 minute**
- Carbon stored in the wood: **412 metric tons of $CO_2$**
- Avoided greenhouse gas emissions: **423 metric tons of $CO_2$**
- Total potential carbon benefit: **835 metric tons of $CO_2$**

GHG EMISSIONS ARE EQUIVALENT TO:

- **177** cars off the road for a year
- Energy to operate **88** 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.

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

**naturallywood.com**