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**K-12 schools in BC
have incorporated
wood into their
buildings in the
last 10 years.**

**Wood Use in
British Columbia
Schools¹** written
by architects
thinkspace and
engineers Fast + Epp,
is a practical report
for school districts,
administrators, and
design professionals
to include wood in
school buildings.

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WOOD USE IN BRITISH COLUMBIA SCHOOLS

Wood and mass timber are well-suited for the new design of schools in British Columbia, which place students at the centre of the learning experience.

Wood is strong, durable, and easy to modify. The natural feel of wood creates optimal learning conditions and healthier spaces for children, teachers and staff.

Wood can be locally sourced from healthy and certified sustainable forests, supporting the BC economy while lowering the carbon footprint of a building when compared to more energy intensive construction materials.

Many companies that are pushing the boundaries of wood design and construction are located in BC. School districts have ready access to homegrown leading-edge technology.



Ta'talu Elementary School, in Surrey, will be the first three-storey hybrid mass timber elementary school in BC when completed in 2024. The predominant structure will be post-and-beam glulam, with light wood framing. Load bearing members (beams and columns) will be mass timber. Mass timber was chosen because it matched the school's sustainability ambitions to reduce carbon emissions—adding to the aesthetic, biophilic, and enhanced learning properties that wood offers.

¹naturallywood.com/resource/wood-use-in-bc-schools

UTILIZING WOOD IN SCHOOL CONSTRUCTION

Impact on Learning

Wood and mass timber provide flexible design, allowing for more open concept design in schools. This meets the learning goals and environment of teaching in BC, keeping the student experience at the centre.

Health and Wellness

The use of wood in classrooms creates a healthier learning space that promotes both mental and physical well-being, and increases learning potential. Wood finishes, in combination with acoustic insulation, can be applied to walls and ceilings to control sound transmission creating calmer shared spaces.

Culture and Tradition

BC's redesigned K-12 curriculum explores Indigenous worldviews, perspectives, cultures and histories across multiple grade levels and a range of subject areas. BC has many examples of schools where wood construction and detail create a strong architectural expression of local Indigenous cultures.



Architect: KMBR Architects Planners Inc. | Photo credit: Ed White Photographics

Gibsons Elementary School on BC's Sunshine Coast was built as part of the Province's seismic upgrade initiative. The classrooms are in a different wing than the gymnasium, neighbourhood learning centre spaces and multi-purpose areas—making it possible for the community to maximize usage of these facilities without disrupting academic spaces.

BC Building Code

Under the BC Building Code (BCBC), school buildings fall under the Major Occupancy Classification Group A Division 2 (Group A-2), which is used to determine which BCBC requirements will apply to the design and construction of a school. The codes applied to schools are stringent, not only to protect students and occupants, but also because schools are likely to be used as a post-disaster shelter. While the building code does not currently allow for mid-rise timber schools, alternative solutions is a method of compliance within the code.



Architect + photo credit: Lubor Trubka Associates Architects

The use of wood in buildings and as a part of daily life is an integral part of the heritage and culture of the Kwakiutl First Nation. The Kwakiutl Wagalus School in Port Hardy incorporates wood a prominent structural element as well as for interior and exterior finishes. The building incorporates western red cedar in posts, beams and cladding, Douglas-fir for doors and windows, birch veneer finishes and a maple hardwood sports floor. The gymnasium walls, made of an all-wood wall system, and roof, made of lumber and Douglas-fir glulam, were prefabricated off-site to speed up construction. It took a small local crew 19 days to erect the gym walls and nine days to install the roof.

Speed and Ease of Construction

Mass timber products and systems are typically prefabricated off-site in a controlled environment, resulting in higher levels of quality control, faster assembly on site, and a reduction in construction waste and disruptions to the neighbourhood.

Cost Effectiveness

Mass timber can have up to a 25 percent savings over concrete construction if wood is considered in the early stages of project design. Mass timber projects can have efficiencies gained from prefabrication and reduced time on site, which will lower labour costs. The availability of local trades and wood products can also ensure savings. Mass timber can also be left exposed, instead of being wrapped in drywall, which can reduce finishing times and costs.

Carbon Emissions

Wood products store carbon in a building over its lifespan. The manufacture of wood products requires less energy than alternative materials. Wood is less conductive and helps meet stringent energy targets. Wood complements teaching modules that focus on sustainability as well as local and province-wide goals of reducing carbon emissions.

ADVANCES IN WOOD TECHNOLOGY + CODE

Technology in the mass timber and wood construction industry has evolved rapidly over the last decade, making materials more accessible, more affordable, and more technologically advanced, including:

- Wider availability of mass timber products and fabrication automation of nail-laminated timber.
- Advances in structural connections and techniques, made possible through research and changes to standards and building codes. Composite systems and point-supported mass timber construction open up design options.
- Use of building information modelling (BIM) and computer numerically controlled (CNC) machining allows projects to utilize suppliers' advanced automated machinery to create panels, beams, or columns in off-site fabrication.

Both the Canadian National Building Code and the BC Building Code have added several provisions to accommodate mass timber construction. Together, the two code revisions remove many of the barriers to wood use in schools that previously existed.



Architect: hcma | Photo credit: Bright Photography

Long-spanning mass timber forms the school's quadrant configuration of Sir Matthew Begbie Elementary School in Vancouver. Cross-laminated timber (CLT) serves as both gravity and shear walls, to resist the high seismic forces of the region. CLT and connectors were fabricated off-site and delivered to site for easy erection.

Learn more at
info.naturallywood.com/schools

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