

Putting Wood to Work in BC

A User's Guide



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A BRIEF HISTORY

There's something exciting emerging in the contemporary built environment in British Columbia. It's a renaissance in wood design and construction of many types of buildings; from commercial structures, to mid-rise residential buildings, to civic facilities. We're discovering what's old is new again, and reconnecting with the story of our province.

When British Columbia (BC) joined Canada in 1871, its economic foundation was firmly rooted in the forest sector. Likewise, the wood and building culture of the era left us with a wood legacy that stands today in many of the historic parts of our towns and cities. While that may have waned in the early part of the 20th century, it has re-emerged today with a dynamic and exciting new potential for our built environment.

BC is gaining international recognition for its burgeoning wood culture, with world-class design expertise and growing wood technology. With the advent of modern building codes, this has advanced opportunities and innovation in wood design and

construction in BC and beyond. As the development and acceptance of technologically advanced wood products and systems has grown, so too has the sophistication of structural and architectural design. We continue to be amazed by what's possible with wood.

**Wood is durable, healthy, flexible,
cost-competitive and is a renewable
building material which can address climate-
change and urbanization
issues we face in the 21st century.**



Wood has become the principal material in many significant new projects in BC and is recognized for its contributions to green aspirations as well as the socio-economic, aesthetic, construction efficiency, structural performance or cost benefits it brings. From rural BC to larger urban centres such as Vancouver and Victoria, these projects have demonstrated that wood use is integral to innovative architecture, design and engineering.

British Columbia

MOVING TOWARD A GREENER BUILT ENVIRONMENT

Designers, developers and builders across the province have pushed BC to the forefront of the global experience by building inspiring and innovative structures using a new generation of technologically advanced wood building products, systems and techniques. With the completion of the tallest contemporary wood building in North America in Prince George in 2014, the Wood Innovation and Design Centre (WIDC), the possibilities for wood are exciting and seemingly endless.

The genesis of building taller and larger wood structures in BC was the initiation of wood demonstration projects in 2010. Supported by the forest products and wood design industries, the Government of BC and Natural Resources Canada, the important innovations demonstrated in these milestone projects were intended to expand the use of the next generation of wood products and systems and create innovative wood solutions structurally or architecturally.

Some of those solutions include the use of mass timber; very large, complete wall, floor and roof sections made from engineered wood panels and beams, and used in a variety of building types and sizes. These products offer significant benefits in terms of fire, acoustic and structural performance; scale possibilities, rigidity, strength, stability and construction efficiency.

Since then, more than 40 innovative local government wood buildings have been constructed throughout BC, reflecting advancement of wood design and construction using the next generation of architectural and structural wood products and systems in contemporary designs.

Wood is now the construction material of choice in the mid-rise residential market in BC. There are now hundreds of mid-rise residential buildings at various stages of planning, construction and completion. The new 2015 National Building Code of Canada will permit mixed-use six-storey (mid-rise) light-



frame wood construction in Canada, which will add an exciting new dimension to our urban spaces, pending jurisdictional approvals.

Wood *WORKS!* BC has been at the leading edge of the work that made these achievements in our built environment possible including a revision to the **BC Building Code** (2009) permitting six-storey (mid-rise) residential light-frame wood construction; the implementation of the **Wood First Act** in BC (2009) which requires wood to be considered as the primary building material in all new publicly-funded buildings, in a manner consistent with the British Columbia Building

Code; and the **approval of alternate solutions** in taller, larger and more complex wood buildings. These significant milestones, together with the leadership and vision of BC's bold building and design community and support by the Government of BC and Natural Resources Canada, have combined to advance the use of wood across the province, strengthening our value-added wood manufacturing capability, bringing pride and prosperity to forest-dependent communities, creating innovative and iconic buildings; positioning BC as a global leader in wood design and building and leading the way on climate-friendly construction.



Advancing wood use in BC – the rationale

ENVIRONMENTAL

Wood products and systems have a number of environmental benefits. Wood is the best choice for the environment, as nothing can make a green building “greener” than optimizing the use of wood materials. Wood products and systems are “climate-friendly” because of their ability to lower a building’s life-cycle carbon footprint by sequestering carbon.

As trees grow, they absorb carbon dioxide from the atmosphere and release oxygen back into the atmosphere. Wood materials sequester CO₂ throughout their use so substituting wood for other materials avoids substantial amounts of CO₂ emissions. In addition, wood buildings can help reduce energy consumption while in use and, even if the materials cannot be re-used, they can usually become a low carbon source of energy.

The United Nations Committee on Land Use, Land Use Change and Forestry, the Nobel Prize-winning report from the United Nations Intergovernmental Panel on Climate Change and many other international organizations agree – building with wood harvested from sustainable forestry operations is one of the best ways to mitigate climate change. And, when sourced from BC’s sustainably managed forests, wood provides an abundant supply of environmentally friendly building products.

Given this globally- accepted reality, community plans should encourage and support the specification of wood products and systems as the primary building materials for all new local government buildings. There is no better, environmentally friendly material for building and design than what is growing all across our province: wood!



ECONOMIC

The reasons for encouraging the use of wood building products and systems in institutional, commercial, industrial and multi-unit residential construction are also grounded in building provincial prosperity. Much of BC is founded on forestry and it continues to sustain our communities and provincial economy today.

Greater use of engineered wood products, like cross-laminated timber and glulam, fosters innovation and the growth of value-added businesses across BC.

HEALTH

There is a growing body of research demonstrating that working, learning and healing environments can be more healthful if they include natural elements in design, including wood. Scientific studies from around the world have demonstrated positive impacts such as reduced heart rate, lower blood pressure and reduced stress and can lead to higher levels of health, better concentration and generally improved occupant well-being and performance for workers, students, patients and residents.

DIVERSE AND DISTINCT BUILDINGS

Wood fits an array of local government project types and applications ranging from fire halls to arenas to recreation centres. Wood is suitable for both a finish material, bringing warmth and natural beauty to interior and exterior applications, but also as a strong structural material, making distinctive and iconic structures possible.

PRIDE AND PROSPERITY

Communities in BC are proud to use wood. From the majestic long houses of First Nations from many years ago, to contemporary and innovative wood structures such as the North Vancouver City Hall revitalization project and Elkford Community Conference Centre, wood use has expressed BC's story like no other material. Not only is there a strong historical context for its use, but there are compelling contemporary benefits for communities as well, leading us to a more prosperous and sustainable way of life in the future of this province.



COST-EFFECTIVE

Wood has proven to be a cost-effective building material. There are also considerations on the final project cost such as construction efficiency, building performance and employee productivity.

INNOVATIVE

Advanced technology and modern building codes are expanding opportunities for wood building products and systems. Mass timber offers significant benefits in terms of fire resistance, acoustic and seismic performance as well as construction efficiency. The outcome: on-time, on-budget innovative and high-performance structures, designed and built throughout BC.



LEADERSHIP

The expanded use, application and development of innovative wood technologies, products and systems have been encouraged by the federal government through Natural Resources Canada, the Government of BC through Forestry Innovation Investment, **Wood WORKS! BC**, FPInnovations, and BC Wood Specialties Group. FPInnovations is one of the world's largest wood product research organizations and BC Wood is BC's agency promoting the value-added wood products sector in the province. These efforts have been supported and advanced through design professionals and organizations such as UBC and UNBC, positioning BC as a world leader in wood construction, design and education.

“Innovative new technologies and building systems have enabled longer wood spans, taller walls and higher buildings, and continue to expand the possibilities for wood use in construction.

Wood is more than a building material; it's a renewable and responsible choice.” *–naturally:wood*

About Wood *WORKS!* BC

Wood *WORKS!* is a national program of the Canadian Wood Council, with a goal to support innovation and provide leadership on the use of wood products and systems in design and construction. Through awards programs, large symposia, workshops, seminars and case studies, Wood *WORKS!* provides inspiration, education, training and technical expertise to building and design professionals and local governments involved with commercial, institutional and industrial construction projects throughout BC.

Since 1998, Wood *WORKS!* BC has worked with design teams, owners and contractors to facilitate practical, efficient, versatile and cost-effective building and design solutions through the use of wood – the most sustainable, natural and renewable building material on Earth.

Our technical advisors can outline recent innovations in wood building products and systems to create functional and practical spaces within your building and operating budget. We are here

to contribute our technical knowledge and experience, provide training and education, offer specific solutions and project assistance to help you realize warm and beautiful environments in which people thrive – free of charge.

Wood *WORKS!* BC: Your “building with wood” resource

Wood *WORKS!* BC is a recognized resource to assist BC communities when designing and building with wood on publicly-funded projects as part of the Wood First Act. With a demand by local governments and building and design professionals for a high level of product expertise and technical knowledge, Wood *WORKS!* BC provides support – helping optimize wood use in building and design, with an outcome of beautiful, expressive and innovative buildings.

We would be pleased to work with staff and design teams on your project to ensure wood is used effectively and appropriately.

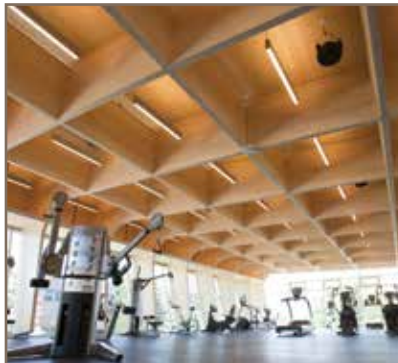


What's new in the world of wood?

LET WOOD *WORKS*! BC SHOW YOU THE ADVANTAGES AND POSSIBILITIES.

WOOD *WORKS*! BC WILL HELP YOU:

- enhance your team's vision of a structural or architectural wood signature for your next project
- increase your team's knowledge of wood's environmental performance
- direct your choice to the right engineered wood product and system for the job
- guide you through the latest structural wood systems including the growing interest in mass timber panel systems
- inform you on what is available in new innovative wood connections
- assist in detailing your wood structure to maximize its durability by design
- engage our resources to increase the use of wood within the requirements of the codes and explore new innovative solutions that go beyond
- seek our expertise on mid-rise construction
- comply with the Wood First Act



SUPPORT ON WOOD PRODUCTS AND SYSTEMS AND THEIR BENEFITS

Climate-friendly, healthy, flexible, beautiful, cost-effective and strong. The benefits of wood are clearly documented, and now they can be enjoyed in your next building. Wood *WORKS!* BC technical advisors can recommend appropriate wood products, systems, and techniques and provide or direct you to structural, fire, seismic, acoustic, envelope and architectural advice.

TECHNOLOGICAL ADVANCEMENT: THE NEW WOOD

Wood has been hailed as the most technologically advanced building material available today. We're not talking about your grandfather's 2X4s. This is about new engineered wood products and systems that are being used around the world to construct bigger and taller structures. These massive beam and panel products have more in common with concrete and steel than wood when it comes to strength, but are more sustainable, faster and more efficient to assemble and provide both seismic and fire resistance advantages.



SUPPORT ON AFFORDABILITY

Advances in engineered wood building products, systems and techniques have led to more affordable buildings. Our province's wealth of leading-edge designers, supported by Wood *WORKS!* BC can show you how to make more of your scarce building and operating budgets.

SUPPORT ON EFFECTIVE, COMFORTABLE COMMUNITY PLACES

Our technical advisors can outline all the recent wood innovations to create comfortable, flexible and effective spaces with an architectural or structural wood signature. It's important to note that wood buildings can also be retrofitted for new uses and more easily updated to new design styles.

SUPPORT ON INNOVATIVE AND LARGER BUILDING TYPES

Wood *WORKS!* BC can help you use wood for all kinds of projects – large and small – and even the “out of ordinary”, including community stages, sound abatement walls, transit shelters and bridges.

Wood *WORKS!* BC has also assisted and supported many local governments, health agencies and education boards in their quest to use wood in significant new capital projects. The outcome: innovative buildings for higher education, health care, the justice system, transportation, housing, services for seniors, and recreational and community facilities.

SUPPORT ON BUILDING CODE AND PERFORMANCE CONSIDERATIONS

Wood products and systems are a safe and healthy choice for all public and civic buildings. It's important to note that building codes require all building systems to perform to the same level of safety, regardless of the material used in construction. In fact, wood meets and in some cases exceeds code requirements.

SUPPORT ON THE WOOD FIRST ACT

Wood *WORKS!* BC is the recognized resource to assist BC communities when designing and building with wood on publicly-funded projects as part of the Wood First Act. Wood *WORKS!* BC has provided communities with technical assistance – free of charge – for almost 20 years. We have worked with local government staff, design teams and contractors as well as provided guidance in a variety of areas including Wood First commitments, RFP wording, design specifications, procurement, sustainability, code and fire issues, communications and innovation in design.

“With growing pressure to reduce the carbon footprint of the built environment, building designers are increasingly being called upon to balance functionality and cost objectives with reduced environmental impact. Wood can help to achieve that balance. Wood costs less – economically and environmentally – while delivering more in terms of its beauty, versatility and performance.” *–naturally:wood*

Committing to wood in your community

As of January 2015, 53 communities across BC had passed or endorsed resolutions or policies indicating their intent to adopt wood in their public buildings. By putting in place policies that encourage wood use, communities across the province benefit with new, functional and innovative facilities.

HERE'S HOW:

- **Documenting your community's intention to use wood whenever possible in civic buildings is one way to reach sustainability goals with an outcome of aesthetically pleasing and expressive buildings.** When passing a resolution, bylaw or policy to encourage wood use, a community benefits by having guiding principles for use by designers, engineers and

contractors to create new, functional and innovative facilities. Buildings such as the Czorny Alzheimer Centre in Surrey – a local government which has adopted a Wood First Policy, provide optimal care while showcasing BC's leadership in wood design and construction.

Czorny Alzheimer Centre, Surrey

Surrey is the largest centre to date to adopt a Wood First policy – passed in November 2010. The Czorny Alzheimer Centre in Surrey is a 30,000 square foot, 36-bed facility providing both complex care and day care services for Alzheimer sufferers.

The design was based on studies that have shown that environment strongly influences the behaviour of people with the disease and that thoughtfully-designed physical environments can maintain and even enhance

their ability to function and improve their quality of life. Throughout this project, wood was used to alleviate or conceal evidence of the functional and institutional requirements for the occupancy. The use of wood allowed the design to be a familiar residential scale while providing the support spaces and infrastructure required for 24-hour nursing care. The wood architecture and millwork were designed to be as simple and positive as possible.



- **Setting sustainability goals for your community, which will ensure that wood products and systems are ultimately included as materials of choice in your buildings.** Some other ideas include a requirement for life cycle analysis of project proposals and/or calculation of lowest embodied and operation impact. Other approaches include a sustainability charter or a carbon neutrality policy. The City of Vancouver is

a local government with green building policies in place, and has set a high standard for environmental performance in public structures. VanDusen Botanical Garden Visitor Centre is an example of an outcome from these policies. Committing to green building policies can be one of the best ways to leave a legacy for your economy, your community and our planet.

VanDusen Botanical Garden Visitor Centre, Vancouver

This remarkable project creates a harmonious balance between architecture and landscape, and features extensive wood products, including a complex panelized roof structure. With wood as the primary building material, the wood provided an added environmental

benefit – it sequesters enough carbon for the project to achieve carbon neutrality. It is the first building in Canada to register for the Living Building Challenge, the most stringent measurement of sustainability in the built environment.



- Asking for wood at the outset of a project, and keep on asking.

Revelstoke Secondary School & Begbie View Elementary School, Revelstoke

School District 19 (Revelstoke) started planning two new schools before January 2011 when the city signed its Wood First policy to promote the use of wood in government-funded buildings. But that didn't stop Anne Cooper, the district's superintendent of schools at the time, from calling for designs that used as much wood as possible for Revelstoke Secondary and Begbie View Elementary schools – structurally and architecturally. She wanted to demonstrate to students, staff, visitors and the community

the aesthetically pleasing attributes of wood, while gaining the environmental and economic benefits for Revelstoke and the region. Both construction projects also supported local labour and materials; saluting the region's historical ties with the forest sector. The fir decking used for the roof was harvested, purchased and milled by local people, and structural wood beams came from the Okanagan.



MORE WAYS TO GET WOOD INTO YOUR PROJECT AND KEEP WOOD IN YOUR PROJECT

- Amend your procurement policy to reflect how important it is to use wood wherever possible.
- Embed your desire to use wood in the design of your projects into your Expressions of Interest to attract wood champions.
- Embed your desire to use wood in all your documents.
- Engage the local wood industry early on in the design process.
- Ask the right wood questions when conducting your interviews.
- Don't settle for just an architectural splash; seek an innovative structural wood solution.
- Ask "Why Not Wood?" until you get an answer.

Committing to wood in your community

The growing use of wood in BC is reshaping our built environment, constructing aesthetically pleasing, healthy and innovative buildings; acknowledging the story of our past and contributing to future prosperity in our province; growing markets for BC's value-added wood products and systems; and helping to achieve a lower carbon footprint in our cities and towns.

"Build with wood" policies and bylaws have been adopted in more than 50 BC communities, while other local governments have opted to realize wood in their building projects through sustainability goals.

Whatever the approach, it's laudable: maximizing the use of wood is making our buildings and communities better, and positioning BC as a leader in wood design and construction. The building and design community, forest products industry, government and researchers are encouraging and supporting that quest.

It is clear that there is a paradigm shift in the way we build our towns and cities. The future is here – it is time to explore the new possibilities for wood in design and construction in your community.

WAYS TO KEEP WOOD IN YOUR PROJECT

- Engage Wood *WORKS!* BC technical advisors as soon as you start thinking about a new project.
- Be prepared to enforce your resolution, bylaw or procurement policy directives.
- Become knowledgeable. Develop a clear understanding of what you believe is possible with wood for your project – and insist on it.
- Having selected a wood-savvy design team, be clear with all team members that you expect to see all of the wood right through to the final implementation.
- Let your design team know that you are willing to work with them to deal with any and all issues that could result in wood being marginalized in the project.
- Educate and prepare the public about the benefits of having wood in the final building, and address any fears and concerns that may exist.
- Engage building officials at the outset; help them to understand the design and how the wood elements meet the performance requirements of the structure.
- Engage fire officials and explain how the design and implementation integrates with their access requirements, fire-fighting equipment, water pressures and other important factors.
- Work closely with quantity surveyors and stay involved in the ongoing cost analyses and trade-offs. Work with them toward solutions that keep wood in the building.
- Rally your community. Many communities across BC have developed exciting and innovative examples of the diverse possibilities that wood products can deliver. This is garnering increasing international attention. Make sure your community knows that it can share in this pride.

Call Wood *WORKS!* BC today for a free consultation.

“Wood WORKS! connects people with products; solves issues with solutions and facilitates inspired, effective and appropriate uses of wood.” – Bill Billups, Technical Advisor, Wood WORKS! BC

PROFESSIONAL DEVELOPMENT:

Wood *WORKS!* BC offers educational events for professional development learning credits for architects, engineers and others along with many other resources.

ADDITIONAL RESOURCES:

For BC project profiles, information on green building rating systems and wood products and systems, please visit: naturally:wood.com and bcwood.com.



WOOD SOLUTIONS FAIRS



WOOD DESIGN LUNCHEONS



IN-HOUSE SEMINARS



WORKSHOPS



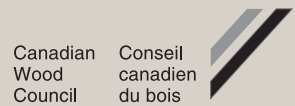
WOOD DESIGN AWARDS



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