

Wood Use in 2010 Olympic & Paralympic Venues

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British Columbia Forest Facts

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Richmond Olympic Oval, spruce-pine-fir (SPF) WoodWave panels, Douglas-fir glulam

2010 WINTER OLYMPICS: WOOD DESIGNS CAPTURE GOLD

The magic of the 2010 Olympic and Paralympic Winter Games may have ended when the torch was extinguished – but the legacy lives on through the spectacular wood structures that hosted the world.

From the iconic Richmond Olympic Oval and world-class Vancouver Convention Centre to tiny tourism kiosks in the host cities of Whistler and Vancouver, the beauty and diversity of British Columbia forests products and the innovation and creativity of its forest industry shared the stage with Olympians and Paralympians.



Vancouver Convention Centre, West Building, hemlock wood wall, Douglas-fir glulam beams



Trout Lake Ice Rink, Douglas-fir glulam beams

VANCOUVER 2010: WORLD-CLASS SUSTAINABLE GAMES

British Columbia promised a sustainable Olympics in its host bid, and delivered by considering environmental and social needs from early planning to the closing ceremonies.

Construction was planned to minimize impacts, especially for sites within or near protected areas or areas of high biodiversity value. Studies and inventories identified areas where at-risk species might exist so they could be avoided – cross-country skiing trails were designed to minimize risks to species and habitat, including grizzly bear habitat.

Wood waste generated from site-clearing activities was chipped and reused on-site for revegetation purposes. Games organizers and other partners even relocated wetland plant species of local significance from the site of a snowmaking reservoir to nearby wetlands.

Building with wood was an important element of the Games green legacy. Benefits of using wood from British Columbia for Olympic venues include the fact the province has rich, diverse forests that meet some of the toughest forest regulations on earth – and is a world leader in third-party sustainable forest management certification.

A healthy, sustainable forest can mitigate climate change by reducing greenhouse gas from the atmosphere and storing it as carbon in trees. Using wood volume numbers provided by the Canadian Wood Council, FPIinnovations calculated the carbon impact of the design decision to use wood in place of other materials for the Olympics venues represents a total greenhouse gas reduction of about 26,000 tonnes. The total potential carbon benefit for the Richmond Olympic Oval alone - resulting from carbon storage and avoided emissions - was an estimated 8,800 metric tonnes of carbon dioxide, or the equivalent of removing 1,600 cars from the road annually.

The venues are part of the lasting social legacy of the Games, which inspired wellness, offered access to athletes and spectators with disabilities, and provided a platform to showcase the work of artists from the local host First Nations as well as First Nation, Inuit and Métis communities across Canada.

THE RICHMOND OLYMPIC OVAL: INNOVATIVE AND NATURAL

The signature structure for the Games was the Richmond Olympic Oval with a soaring all-wood roof made of prefabricated one-of-a-kind WoodWave panels and glulam beam arches – including one of the world’s largest clear spans.

Covering 2.4 hectares, the roof was made possible by advanced wood engineering. It used a million board feet of 2x4 spruce-pine-fir (SPF) dimension lumber and 19,000 sheets of plywood. An addition one million board feet of Douglas-fir lamstock lumber was used in the glulam beams.

During the Games, the Oval held up to 8,000 spectators and hosted speed skating events. Marion LaRue of Cannon Design Architecture Inc., senior project manager of the design team, said the positives for athletes included the natural light, the setting, and the wood. *“We know that natural materials like wood create spaces that influence the psychology of people - for instance with healing in a health care setting. It makes sense that the natural materials and the connection to the natural world at the Oval create a space that is a positive environment for competition.”*

The Oval officially opened one year before the Games, and earned a \$1.1-million profit in 2009. This was largely due to support

from members, 85 per cent of whom live in Richmond, a city of close to 200,000 people located 14 kilometres south of downtown Vancouver.

After the Games, the Oval became an international centre of excellence for sports and wellness – its flexible design allows it to be used for a wide variety of different sport and community uses, including a fitness centre, basketball courts, two ice rinks and an indoor sprint track.

MOUNTAIN PINE BEETLE

Many venues were made with wood from pine forests in British Columbia’s Interior impacted by a mountain pine beetle infestation – making use of the trees and demonstrating the province’s confidence in the quality of the resulting wood products. The beetles carry a fungus that leaves a blue or grey stain but this has no effect on the wood’s strength properties. Venues made with this wood came in all sizes – from the Richmond Olympic Oval to the compact BC Hydro Home of the Future and the L41 prototype.



BC Hydro Home of the Future, western red cedar ceiling





VANCOUVER TRADE AND CONVENTION CENTRE: WORLD-CLASS AND GREEN

With its breathtaking mountain and ocean views, the Vancouver Convention Centre was the ideal broadcast centre for the Games. Its new West Building – 60 per cent on land and 40 per cent over water – tripled the centre’s capacity before the Olympics, offering a combined total of 466,500 square feet of meeting, exhibition, ballroom, and plenary theatre space. More than 350 events in the first 12 months of operation attracted 225,000 delegates.

The West Building is a showcase for architectural wood use, with innovative and

creative applications of coastal and interior wood species, dimension lumber and glulam beams. The floor-to-ceiling glass delivers phenomenal vistas and means the Douglas-fir and hemlock wood-finished surfaces can be seen from inside and outside the building. The structure earned a platinum LEED® rating, and is a masterpiece of green technology – from the largest “living roof” in Canada with 400,000 indigenous plants and grasses and four beehives, to seawater heating and cooling, on-site water treatment and even fish habitat built into the foundation.

WHISTLER OLYMPIC/ PARALYMPIC PARK: DAY LODGE

The decision to use glulam made with local Douglas-fir instead of steel for its superstructure allowed the spectacular Day Lodge at Whistler Olympic Park in the Callaghan Valley to blend into the natural environment.

The venue southwest of Whistler Village hosted biathlon, cross-country skiing, Nordic combined and ski jumping. Located between the ski jumps and the cross-country skiing stadium, the Day Lodge was the centre of the venue during the Games, and continues to serve as a hub and starting point for winter and summer recreational activities.



The venue is operated under the direction of the Whistler 2010 Sport Legacies, supported by a \$120 million endowment trust established by the federal and provincial governments as part of their 2010 Winter Games venues investment.



CYPRESS MOUNTAIN DAY LODGE

The timber frame Day Lodge, with prefinished board and batten with natural stone accents, hosted snowboard and freestyle skiing competitions. The superstructure and roof decking were made with Douglas-fir glulam, and the exterior is pre-finished spruce-pine-fir (SPF) lumber. It opened in advance of the Games, and is the central hub for all activities in Cypress Provincial Park during both the summer and winter seasons.

*Cypress Mountain Day Lodge,
Douglas-fir beams*



TROUT LAKE ICE RINK

Olympic figure skaters were able to practise in the new Trout Lake Ice Rink, the first phase in the replacement of an aging community centre facility in the Grandview area of east Vancouver. The arena, located in John Hendry Park, features Douglas-fir glulam beams and columns, and the ceiling of the Skaters' Lounge and other architectural woodwork detail was made with wood from trees blown down in Vancouver's Stanley Park during an intense 2006 windstorm.

The Olympic-sized rink was converted to a standard size after the Games for community recreational use.

PERCY NORMAN AQUATIC CENTRE

The designers of the Percy Norman Aquatic Centre chose a solid wood roof supported on Douglas-fir glulam beams for its superior structural performance in humid conditions, acoustic and visual qualities, and value as a sustainable local product. The aquatic centre is part of the new Riley Park Community Centre at Hillcrest Park in Vancouver, which was a curling venue and marshalling area for athletes during the Games. It now is a multi-purpose community recreation centre that will include an ice hockey rink, gymnasium, library and six to eight sheets of curling ice.



GLULAM – BEAUTY AND STRENGTH

Glulam – glue-laminated products – is a structural timber product manufactured by gluing together individual pieces of dimension lumber under controlled conditions. Its attributes make it an excellent choice for attractive and innovative architectural designs.





TEMPORARY STRUCTURES: FLEXIBLE AND CREATIVE

BC Hydro Home of the Future

The 680-square-foot BC Hydro Home of the Future was created for the Games and will continue to show how sustainability can be part of everyday life. Made from two steel shipping containers, the home featured the latest in sustainable design – with wood inside and out. The exterior wood siding was made with western red cedar and lodgepole pine, and the interior featured western red cedar in the ceiling and laminate flooring – which still looked great after 200,000 visitors.

Tourism BC Information Kiosks

Staff in key locations in Vancouver, Whistler, Richmond and West Vancouver provided information on attractions, transportation and much more from 16 temporary visitor information made with British Columbia wood. The Whistler kiosk will remain as a legacy structure, and some of the others will be relocated so they can continue to be used to welcome tourists.

L41 – Medium-Rise Building Prototypes

The Games represented an ideal opportunity to show the world British Columbia’s advanced wood engineering. L41 – the prototype for the development of medium-rise buildings – was made with lodgepole pine cross-laminated timber (CLT). This new wood product is so strong it can be used as a substitute for concrete in medium-rise buildings. CLT is made of planks laminated in layers at right angles to each other and glued together under great pressure to create panels up to 18 feet by 60 feet, and two inches to 24 inches thick.



WOOD PODIUMS CONNECT BC COMMUNITIES TO GAMES

When Canadian Christine Nesbitt was awarded a gold medal for winning the 1,000-metre speed skating event, she was standing on a podium made of coastal Douglas-fir from the Powell River Community Forest just north of Vancouver.

Community forests provide jobs and help develop skills, support environmental stewardship and build links between First Nations, towns and villages, and the financial returns pay for community facilities.

It was one of 23 podiums used for medal presentations, and made with 18 different types of wood donated by communities, First Nations, businesses and individuals from across British Columbia. In addition to Port Hardy, the wood came from community-based forests in Bella Coola, Cheslatta Carrier Nation, Clearwater, Fort St. James, Houston, Ktunaxa Nation, Likely and Xat’sull First Nation, McBride, Mission, Port Hardy, Prince George, Revelstoke, Sechelt and the Westbank First Nation – and each donation came with a story about the people and places that make up the province.

Each podium was assembled from more than 200 pieces of wood. Rough lumber was converted to panels that were then cut into complex shapes using sophisticated computer-controlled machinery at the University of British Columbia’s state-of-the-art Centre for Advanced Wood Processing.

Olympic organizers auctioned off many of the podiums after the Games – the coastal Douglas-fir podium found its way to Shanghai where it was used in the Vancouver Pavilion at the Shanghai 2010 Expo.

WORKING WITH HOST FIRST NATIONS

The 2010 Games were held on the shared ancestral territories of four First Nations – the Lil'wat, Musqueam, Squamish and Tsleil-Waututh – who entered into an historic Protocol Agreement where they agreed to coordinate their collective efforts to host and support the 2010 Olympics.

The 2010 Aboriginal Pavilion (the Chiefs' House) – a unique structure made with western red cedar and Douglas-fir – drew more than 242,000 visitors during the Games, offering a place to meet and mingle in a relaxed, informal setting. First Nations, Inuit and Métis groups from across Canada took turns presenting their cultures through music, dance, drumming and storytelling. After the Games, the Pavilion was relocated to Musqueam land where it will be used as a resource educational centre.

Chief Ernest Campbell of Musqueam Nation spoke for his community: *"As one of the Four Host First Nations we have the opportunity to showcase Musqueam history and culture, and highlight the vibrancy and hospitality of Aboriginal people. We look forward to sharing in the positive and lasting legacies of the 2010 Winter Games."*





Whistler Olympic/Paralympic Park Day Lodge, Douglas-fir glulam and slat soffits

WOOD: A PROVEN ENVIRONMENTAL CHOICE

The 2010 Olympic venues demonstrate how building professionals are choosing wood for green construction designs of all sizes and for all uses.

No other major building material can deliver the same natural beauty and flexibility as wood – or match its environmental attributes. Wood minimizes the use of energy, water and materials, and reduces impacts on human health and the environment.

Trees remove carbon dioxide from the air and use it to create wood, leaves or needles, and roots. When trees burn or decompose, they release the carbon dioxide they have stored back into the atmosphere. When a tree is cut down, about half of the carbon remains in the forest and the rest is removed in logs. Much of this carbon remains stored in wood products used for construction and finishing for decades.

In British Columbia companies harvesting wood must reforest each site with native tree species suited to meet local ecological conditions. Companies are responsible for a harvested area until there is assurance it will grow into a healthy forest. As the forest regenerates, the trees begin to store carbon again.

British Columbia's managed forests are efficient carbon sinks. The combination of growing healthy forests, along with the fact that wood products store carbon for long periods of time, means that sustainable forest management can help lower global greenhouse gas emissions.

FOR MORE INFORMATION

B.C. Wood at the 2010 Winter Olympic and Paralympic Games www.naturallywood.com/Woodin2010Games.aspx

Case studies on the Richmond Olympic Oval, Vancouver Convention Centre and Percy Norman Aquatic Centre and Trout Lake Ice Rink can be found at www.naturallywood.com/Resources.aspx.

About 50% of wood products exported from Canada come from the Province of British Columbia's sustainably-managed forests. This publication is part of the 'Forest Facts' series, published by Forestry Innovation Investment. Visit www.naturallywood.com for details.

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British Columbia wood. Sustainable by nature. Innovative by design.