

## Our Commitment to Sustainable Venues and Athlete Villages

Clustered venue and village locations, compact site design and ecologically sensitive construction and operating practices have been critical in minimizing the environmental impacts of constructing our venues and villages. As a guide, we have used the Leadership in Energy and Environmental Design (LEED) green building rating system criteria to develop buildings that consume less energy and water and use fewer materials while minimizing waste, emissions and use of toxic materials.

Increasing accessibility for athletes and spectators with disabilities and showcasing traditional and contemporary artwork by Four Host First Nations (FHFN), Inuit and Métis artists from across Canada are examples of ways we have integrated social and economic components of sustainability into venue and village development. Through these and other venue-related initiatives, we have worked to create opportunities that specifically benefit those individuals and communities facing economic or social challenges. In the end, we want to leave behind a legacy of sport facilities and mixed residential developments that, following the Games, are capable of meeting the needs of the community on an ongoing basis.

On the following pages, we bring to life some of the sustainability highlights of the Games venues and villages developed by VANOC or our partners and sponsors. For a more complete list of the sustainability attributes of each facility, refer to [vancouver2010.com](http://vancouver2010.com).



(L-R) Minister of Forests & Range Pat Bell, VANOC Executive Vice President, Dan Doyle, receiving the excellence in Green Building Practices Award from GLOBE Foundation President John Wiebe, and Canada Green Building Council President Thomas Mueller

### DID YOU KNOW?

The 2010 Winter Games venues and villages are the largest group of simultaneously constructed, single-project, low-environmental-impact facilities in North America? \*

Source:  
Globe Foundation and World Green Building Council, 2009



## Richmond Olympic Oval

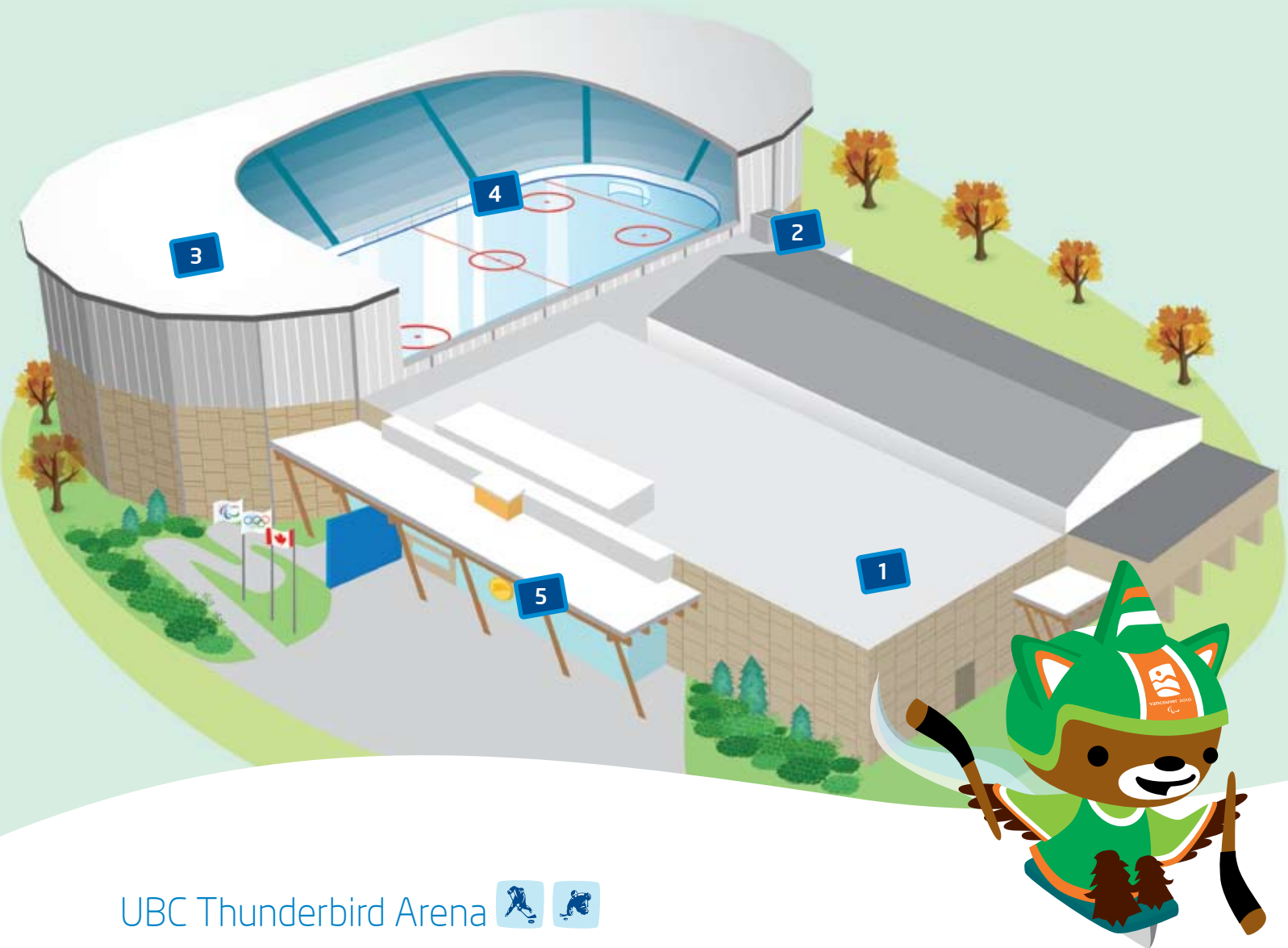
- 1 BC Pine-Beetle Wood Roof** — The Oval’s massive ceiling is made of salvaged British Columbia wood that was affected by a pine-beetle infestation. At a size of about 100 metres by 200 metres (2 hectares), the roof is believed to be the largest surface ever covered using the once-discarded wood. Showcasing use of this wood may encourage its application elsewhere and help mitigate the economic hardship the pine beetle epidemic has brought upon regional communities in British Columbia.
- 2 Rainwater Capture and Reuse** — Rainwater is collected from the Oval’s vast roof through an innovative collection system featuring original Coast Salish designs by Musqueam Nation artist Susan Point. Much of the captured rainwater flows into the building’s utility systems to supplement toilet flushing. The rest is stored in a pond in front of the Oval and used to irrigate surrounding trees and landscaping. Marsh plants in the rainfall collection pond act as natural purifiers, improving water quality in the pond and in the connected Hollybridge Canal.
- 3 Waste Heat Reuse** — Waste heat energy recovered from ice-making is captured and reused for other purposes in the building, including domestic hot water and heating/cooling systems. As the size of the Oval’s speed skating rink is the equivalent of six international hockey rinks, this recovered heat energy is considerable.
- 4 Green Buildings** — The City of Richmond is targeting LEED (Leadership in Energy and Environmental Design) “Silver” green building certification for the Oval, which will be a unique achievement for a facility of the Oval’s size and type.
- 5 Accessible Sport and Community Legacy** — After the Games, the Oval facility, which was designed with flexibility in mind, will be a training and competition facility for many Paralympic sports, including wheelchair rugby, wheelchair basketball and adaptive rowing. The Oval will also serve as a multi-sport and wellness facility, providing a recreation legacy that will benefit the health and wellness of the community.



## Vancouver Olympic/Paralympic Centre



- 1 Smart Site Selection** — The new curling facility replaces an aging, existing community complex located at Hillcrest/Nat Bailey Stadium Park. The new complex is sited primarily on a former gravel parking area.
- 2 Waste Heat Reuse** — Waste heat from this venue’s refrigeration plant is captured and reused to heat other building spaces, the adjacent aquatics centre, and domestic hot water for the facility. Waste heat from the swimming pool area is also recovered through the aquatic centre’s ventilation system.
- 3 Rainwater Reuse** — Rainwater is collected and reused for flushing water-efficient toilets and urinals, reducing the amount of potable water used at this venue.
- 4 Green Buildings** — The City of Vancouver is targeting LEED (Leadership in Energy and Environmental Design) “Gold” green building certification for this facility, post-Games, once the conversion to legacy mode has been completed.
- 5 Accessibility** — This complex is accessible to persons with a disability. For example, the change rooms for the swimming pool at this venue (in post-Games legacy mode) will consist of screen walls rather than doors, making entry more accessible to all users, including persons who use a wheelchair.
- 6 Net-Zero Green Space Loss** — Net-zero green space loss has been targeted in the development of this venue. During the construction phase, trees within the venue construction area were salvaged and relocated to other sites within the park. In the post-Games period, when the venue is being converted to its legacy mode, demolished sites will be revegetated. As well, the existing community centre and pool will be demolished, salvageable materials recycled and the site remediated back to park space.



## UBC Thunderbird Arena

- 1 Smart Site Selection** — Demonstrating smart site selection, this venue involved the redevelopment of an existing facility and included the refurbishment and reuse of several major components of an existing ice plant.
- 2 Waste Heat Reuse** — The venue’s use of an Eco-Chill system to heat the building, which recycles waste heat from ice refrigeration, minimizes energy consumption. Waste heat is used to preheat domestic hot water.
- 3 Green Buildings** — This venue incorporates green building design to a level that’s comparable to a highly sustainable industry practice for sport facilities.
- 4 Accessible for Sport** — Two of the three arenas at this venue are fitted with the Plexiglas boards required for ice sledge hockey, which makes this venue the only arena in Vancouver accessible to ice sledge hockey teams.
- 5 Aboriginal Art** — Aboriginal art created by Direction 7 from the Musqueam Nation, in the form of a large thunderbird carving, hangs at the entrance to the arena as part of the Vancouver 2010 Venues’ Aboriginal Art Program.





## Olympic and Paralympic Village Vancouver

- 1 Smart Site Selection** — The village, which will be home to athletes and officials at Games time, was a catalyst for the redevelopment of a former industrial area, and included preserving the waterfront for public use; ecological restoration of the shoreline; reintroducing intertidal marine habitat and indigenous vegetation; eliminating previous on-site contaminants; and restoring a heritage building. The end result: a fully integrated, socially inclusive community that will, after the Games, be home to 15,000.
- 2 Energy Efficiency** — A Neighbourhood Energy Utility system uses heat captured from the sanitary sewer's main line to serve the village's heat and hot water needs. A Net-Zero Energy Building pilot project for one of the city's affordable housing buildings will include energy consumption monitoring, solar recovery, waste-heat capture and reuse and energy conservation standards above LEED.
- 3 Stormwater Management and Green Roofs** — Stormwater management initiatives include green roofs, bio-swales, permeable pavers, infiltration galleries, rainwater collection/reuse and surface drainage elements (minimal pipes). Green roofs are targeted for a minimum of 50 per cent of the total building footprint, providing natural insulation, stormwater management, habitat and opportunities for rooftop gardening.
- 4 Green Buildings** — The City of Vancouver is targeting Leadership in Energy and Environmental Design (LEED) "Gold" green building certification for all new buildings and the site's heritage Salt Building. For the venue's community centre, LEED "Platinum" is targeted.
- 5 Accessible Design** — Units will showcase universal design elements, such as wider doorways, hallways and stairs that are easily adapted for complete accessibility.
- 6 Community Benefits** — During construction, a community benefits agreement between the City of Vancouver, Millennium Properties (the village's developer) and a local non-profit society provided 100 jobs, \$750,000 in training and \$15 million in procurement for inner-city residents and businesses.
- 7 Aboriginal Art** — This venue will feature a selection of art showcased as part of the Vancouver 2010 Venues' Aboriginal Art Program, which includes traditional and contemporary artwork by Four Host First Nations, First Nations, Inuit and Métis artists from across Canada.
- 8 Legacy Housing** — Following the Games, the village will provide the Vancouver community with a legacy of 250 affordable housing units.
- 9 Sustainable Transportation** — The waterfront redevelopment comprises the newest section of the Seaside Greenway/Bikeway, part of Vancouver's 22-kilometre Seawall. Streets have been designed for pedestrians and bicycles first. Car co-op vehicles and electric hookups are accommodated in underground parking areas.



## Cypress Mountain

- 1 Smart Site Selection** — The freestyle skiing and snowboard venues are located within the existing Cypress Mountain ski area; the snowboard venue is situated on previously developed ski runs.
- 2 Caring for Local Wetland Plants** — In summer 2007, members of the VANOC team, Cypress community partners and other stakeholders joined to salvage and relocate wetland plant species of local significance from the site of the new snowmaking reservoir to nearby wetlands (an area remaining unaffected by venue construction). Follow-up monitoring shows the plants are not only thriving, but they're playing host to rare insects and other wildlife.
- 3 Wood Waste Reuse** — All wood waste generated from site-clearing activities was chipped and reused on-site for revegetation purposes.
- 4 First Nations and the Cypress Legacy Project** — Local First Nations have been working with BC Parks on the Cypress Legacy Project, an initiative supported by VANOC and the Four Host First Nations to create a lasting legacy in the park.
- 5 Local Focus** — During the venue construction phase, emphasis was placed on hiring local workers.





## Whistler Olympic/Paralympic Park



- 1 Smaller Footprint** — Thanks to careful planning, the footprint for Whistler Olympic/Paralympic Park is approximately 30 per cent smaller than the initial design. The venue layout was altered to avoid disturbing old-growth forest and wetlands and incorporates extended riparian buffer areas around streams and wetlands throughout the site.
- 2 Wood Waste Reuse** — Most of the wood waste from construction-phase site-clearing was reused either for temporary compound construction or to revegetate disturbed areas (for revegetation purposes it was composted on-site and reapplied with a wildflower seed mix).
- 3 Benefits for Aboriginal Communities** — Economic opportunities were realized by local First Nations communities; Squamish Nation- and Lil'wat Nation-owned companies were awarded contracts for trail development and building construction at this venue.

- 4 High Quality Wastewater** — An on-site wastewater treatment plant uses leading technology, including tertiary membrane filtration and ultraviolet disinfection to ensure high-quality discharge to local surface water.
- 5 Sport and Recreation Legacy** — With a total of approximately 50 kilometres of cross-country ski trails, Whistler Olympic/Paralympic Park will be a legacy for all to enjoy, including local residents, visitors and athletes (both at the recreational and high-performance levels).
- 6 Green Buildings** — VANOC achieved LEED (Leadership in Energy and Environmental Design) "Gold" green building certification for the on-site day lodge. Other buildings on the site also follow similar green building design principles.





## Whistler Creekside

- 1 Smart Site Selection** — This venue is located on existing ski trails within a major ski area and makes use of existing ski-hill infrastructure, such as chairlifts and gondolas.
- 2 Energy Efficiency** — An energy efficient snowmaking system has been installed along the race courses.
- 3 Protecting Streamside Vegetation** — The men's and ladies' race course alignments were changed in several areas to lessen the impact on streamside vegetation buffers, also known as riparian areas. The total amount of riparian vegetation removed for the training and race courses was significantly reduced, when compared to the amounts proposed and approved for clearing in the initial design plans and Environmental Assessment review.
- 4 Wildlife Management** — Proactive construction management helped avoid and minimize potential impacts to wildlife, aquatic and terrestrial habitat. For example, a tailed frog management plan was implemented during construction which guided the hand-salvage and relocation of hundreds of tadpoles and adult frogs to protect them from potential construction impacts.
- 5 Local Focus** — Emphasis was placed on local employment, purchasing and contracting opportunities during the construction phase of this venue.
- 6 Wood Waste Reuse** — All wood waste from construction of the race course was chipped and reused on-site for revegetation purposes.





## The Whistler Sliding Centre

- 1 Smart, Nestled Footprint** — Demonstrating smart site selection, this venue is located directly adjacent to already disturbed areas within a major ski area. The site was designed to minimize vegetation clearing and overall footprint.
- 2 Energy Efficiency** — Design of this venue focused on energy-efficient initiatives: trees retained throughout the site cast shade; a weather protection and shading system covers much of the track; and the track itself is painted white to minimize heat absorption. These conventions all help maintain track ice temperatures while minimizing energy demand on the refrigeration system.
- 3 Waste Heat Reuse** — Waste heat from the refrigeration plant is captured and reused to heat buildings on-site, with potential to provide additional heat for other uses in the future.
- 4 Green Buildings** — VANOC is targeting LEED (Leadership in Energy and Environmental Design) “Silver” green building certification for the refrigeration plant building. Other on-site buildings also follow similar green building design principles.
- 5 Wood Waste Reuse** — All wood waste resulting from site-clearing activities during construction of this venue was chipped and composted for reuse.
- 6 Sport and Tourism Legacy** — Athlete use, visitor tours, corporate rentals and other creative programming for the facility diversify Whistler’s sport and tourism offerings and provide assurance for the venue’s long-term operations and revenue-generation potential.



## Olympic and Paralympic Village Whistler

- 1 Smart Site Selection** — The mountain village, which will be home to athletes and officials at Games time, provided the impetus to transform an old municipal landfill and recycling site into a sustainable neighbourhood designed to meet the needs of the local community and the environment.
- 2 Energy Efficiency** — The village’s construction includes the development of a community district energy system. The village’s primary heat source is from heat recovered from the municipality’s new wastewater treatment plant.
- 3 Stormwater Management** — An on-site wetland complex has been created for stormwater retention, treatment and habitat enhancement. Stormwater management initiatives also include net-zero drainage impact on the local Cheakamus River and use of roadside rain gardens in lieu of stormwater piping to bio-filter surface water and mitigate storm surge flows.
- 4 Green Buildings** — The village is part of a pilot project with the Canada Green Building Council to test the new LEED for Neighbourhood Development (LEED ND) green development standard. Site selection has minimized disturbance to the natural environment.
- 5 Legacy Housing** — After the Games, the village will provide the Whistler community with a legacy of affordable housing units for resident workers and a high-performance centre (a sport training facility associated with the on-site Whistler Athletes’ Centre).

## Whistler Athletes’ Centre (WAC)

- 6 Legacy Facility** — The WAC will provide affordable post-Games accommodation for athletes, residents and visitors, including a lodge (with 100 hostel-style rooms) and 20 townhomes. It also includes a High Performance Centre (HPC); after the Games, the HPC will provide athletic training facilities for athletes and community residents.
- 7 Green Buildings** — VANOC is targeting LEED “Silver” green building certification for the HPC.
- 8 Energy Efficiency** — The WAC will connect to a district energy system developed for the village. Waste heat recovery systems will be installed in all accommodation buildings.
- 9 Accessible Design** — The WAC’s design has taken accessibility into account to ensure the venue meets the needs of athletes with various disabilities.
- 10 Aboriginal Art** — This venue will feature a selection of art showcased as part of the Vancouver 2010 Venues’ Aboriginal Art Program, which includes traditional and contemporary artwork by Four Host First Nations, First Nations, Inuit and Métis artists from across Canada.