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## **2014 AWARD-WINNING PROJECT: Vandusen Botanical Garden Visitor Centre, Vancouver**

### **JURY COMMENT**

**A beautiful building with an interesting variety of spaces and an innovative palette of materials and assemblies. The very impressive performance metrics are a testimony to an integrated and in-depth approach to mechanical and other building systems. The combination of architectural excellence and high technical performance is compelling.**

Located five kilometres from downtown Vancouver, the VanDusen Botanical Garden preserves a 22-hectare environmental oasis within an increasingly dense urban context. Inspired by a native orchid, the Garden's new Visitor Centre considers the complete system of environmental technologies – how the building operates, what it's made of, and the nature and ecological systems around it – and tries to make a positive contribution to all of those things.

The 17,000 m<sup>2</sup> Visitor Centre houses a café, library, volunteer facilities, garden shop, offices and flexible classroom/rental spaces. The project is targeting both LEED Platinum certification and recognition under the Living Building Challenge [LBC]. The stringent requirements of LBC include net zero energy, net zero water and the use of healthy local materials.

Through analyzing the Garden's ecology, the project team was able to integrate natural and human systems, restoring biodiversity and ecological balance to the site. The green roof and surrounding landscape were carefully designed to include native plants, forming a series of distinct ecological zones. A vegetated land ramp was also included to connect the roof to the ground plane, encouraging use by local fauna.

Rainwater is captured on the green roof, which also acts to control excess runoff. This rainwater is then filtered and stored in a cistern. Along with filtered greywater from sinks, the filtered rainwater is used for flushing toilets. 100% of blackwater is treated by an on-site bioreactor – the first of its kind in Vancouver – which is located underground adjacent to the building. Treated blackwater is then released into a new percolation field and garden.

The Visitor Centre generates renewable energy using over 50 geothermal boreholes, solar photovoltaics and solar hot water tubes. Through transferring excess heat energy to nearby Shaughnessy Restaurant, the Visitor Centre obtains an equivalent amount of hydro-electricity from the grid. By exchanging surplus heat energy for electricity in this way, the Visitor Centre achieves net zero energy on an annual basis.

The Materials Imperative calls for avoiding ‘red list’ substances detrimental to human health and the environment. The distance from which materials can be sourced varies according to weight, and there is a high threshold for reclaimed materials. LBC also includes a requirement for construction carbon neutrality, most readily achieved in Canada through the extensive use of wood – which must be reclaimed or FSC certified. Accordingly, the Visitor Centre uses wood for the panelized roof structure, cladding, furnishings, millwork and wall finishes. The sequestered carbon in the wood components offsets the carbon footprint of the other materials used.

## **PROJECT CREDITS**

**Owner** Vancouver Board of Parks and Recreation

**Architect** Perkins+Will

**General Contractor** Ledcor Construction

**Structural Engineer** Fast + Epp

**Mechanical/ Electrical Engineer** Integral Group [Cobalt Engineering]

**Civil Engineer** R.F. Binnie & Associate

**Code Consultant** B.R. Thorson Ltd.

**Cost Consultant** BTY Group

**Envelope Consultant** Morrison Hershfield

**Landscape Architect** Sharp & Diamond Landscape Architecture Inc. with Cornelia Hahn Oberlander

**Lighting Design** Total Lighting Solutions

**Ecology Consultant** Raincoast Applied Ecology

**Acoustical Consultant** BKL Consultants

**Commissioning Agent** KD Engineering

**Commissioning Authority** KD Engineering Co.

## **MATERIALS**

- Vegetated roof by [Zinco Canada](#)
- Rammed earth sidings.
- Glazing by [Columbia Glazing Systems Inc.](#)
- Prefab glued-laminated beam roof system.
- Solar and geothermal energy used to heat water.
- Radiant floor slab heating by [Uponor](#).

## **PROJECT PERFORMANCE**

Energy intensity [building and process energy] = 400MJ/m<sup>2</sup>/year

Net energy intensity [taking into account onsite renewables] = 284MJ/m<sup>2</sup>/year

Energy intensity reduction relative to reference building under ASHRAE 90.1 – 1999  
= 67%

Potable water consumption from municipal sources = 192L/m<sup>2</sup>/year

[Note: Because of large seasonal variations in occupant load litres/occupant was not calculated]

Potable water consumption reduction relative to reference building = 60.1%

Regional materials [800km radius] by value = 30%

Reclaimed and recycled materials by value = 10 %