2013 Wood Design Awards - Project Fact Sheet

Environmental Learning Centre, North Vancouver Outdoor School

Location: Brackendale, BC

Height	Size		Completion	Construction Budget
2	9,042	840	2012-06	4,000,000
Storeys	*sq ft*	*sq M*	*Date*	*$ Cdn*

Project Description:

The Environmental Learning Centre (ELC) is the first building of a master plan for the rehabilitation of the North Vancouver Outdoor School site in Brackendale, BC. The intent is to create an experiential environment that blends natural, human and building ecologies. It is the first building in a master plan that will repair an important ecosystem compromised by years of inappropriate development. Set in a lush river valley in the Coast Mountains of BC, the building will provide a critical context for learning at the heart of the North Vancouver Outdoor School's rural campus. The facility includes a welcome area with a nature gallery and exhibition space, a multi-purpose hall, dining hall, commercial kitchen, two multi-purpose learning spaces, administrative offices and washrooms. There are extensive covered outdoor teaching areas to support the school's goal of immersing students in outdoor learning.

DESIGN CONCEPT: In direct response to the linearity of both the valley and river, the building assumes a narrow linear form. The main floor is raised above the forest floor, on slender "pilotis", scribing the level of the 200 year floodplain and giving users the feel of a treehouse experience. The carefully proportioned form is slotted between stands of mature conifers - preserving trees and forest floor alike. Users occupy the unexpected raised vantage within the forest canopy while the area beneath the building becomes a 'found' program space, providing generous cover for outdoor activities in wet weather. This direct response to the forces of the site aligns the building within the larger element of the river valley, lifts the users into an intimate position within the canopy, preserves the integrity of local habitat, and renders the floodplain both evident and moot.

SUSTAINABLE DESIGN: The sustainable vision for the project was to demonstrate how a building located in an ecologically sensitive setting can appropriately respond to its site and environment. The building itself is a demonstration facility, acting as an educational tool, integral with the teaching program of the Outdoor School. The building minimizes both its need for outside sources of energy and its impact on the environment to uphold the philosophical principles of the school. The vision was to have the site and facility development embody the environmental principles espoused by the school, with the sustainable components and systems of infrastructure and buildings designed as an integral part the learning experience. The project forms the first phase of a master plan of active renewal of the site and its ecosystems, compromised by years of development. The site master plan was designed to foster adherence to the Living Building Challenge standard (Cascadia Region Green Building Council) with net-zero carbon emissions and net-zero energy consumption.

THE USE OF WOOD: The choice of wood as the primary building material echoes the ecologically sensitive nature of the site and the sustainable design mandate of the school. The simple repetitive structural approach facilitated modular wood design, with the pre-fabrication of many building components. This reduced damage to the site by decreasing the extent and duration of on-site construction, as well as ensuring the quality of the wood products and efficiency in material use. Wood used for beams, purlins, columns, and siding is a combination of reclaimed and new timbers sourced and was milled locally where possible to reduce transportation and other embodied energy use.

The primary upper floor structure consists of glulam columns, beams and purlins (fabricated from FSC certified Douglas Fir), providing the frame for the floor, wall and roof assemblies. This heavy timber frame rests upon slender steel "pilotis" at the lower level, whose purpose is to endure flood waters and reduce visual obstructions at grade. Concrete shear walls connect the raft foundation slab to the upper floor and roof structure to provide lateral resistance.

The floor structure consists of glulam purlins spanning between the glulam floor beams, with a solid wood floor assembly of cross laminated timber (CLT) pre-fabricated panels, composed of beetle-kill SPF. The wood floor system is topped with a vapour barrier and polished concrete slab with in-slab radiant heat tubing. CLT floor panels are used to transfer large shear forces resulting from the long span of horizontal diaphragms required between shear walls, while simultaneously limiting the horizontal deflection of the diaphragm. The strength and stiffness of the CLT floor panels provides a valid alternative to concrete slabs and horizontal steel cross bracing. The CLT was erected quickly, shortened construction time compared to concrete or steel systems, and reduced the size of other structural components due to its light weight.

The roof structure, consisting of glulam beams, purlins and reclaimed Douglas Fir timber laid flat as structural decking, is left exposed as the ceiling finish. The layering of beams and purlins allowed the discreet placement of mechanical and electrical services, keeping the visual focus on the wood structure and the beautiful surroundings outside. Exterior and interior walls are framed with Douglas Fir 2x6 wood studs, with plywood sheathing, providing a simple and cost-effective solution for non-loadbearing walls

Project Images

Where the Wood Was Used:

Primary Structural System	Columns, Beams & Braces	y
	Floor Structure	y
	Exterior Walls	y
	Foundation	
	Shear Walls	y
	Bearing Walls	y
	Fire Walls	
	Roof Structure (inc. columns and braces)	y
	Stairway & Elevator Shafts	y
Secondary Structure	Convenience Stairs	y
	Entrances & Canopies	y
	Fire Separations	y
	Enclosures for Mechanical Equipment	y

Architectural	Partitions (interior)	y
	Exterior Curtain Walls	
	Ceilings	y
	Exterior Cladding	y
	Parapets	y
	Ceiling Bulkheads	y
	Flooring	y
	Doors	y
	Windows	
	Skylights	
	Trim, Paneling & Features	y
	Millwork	y
	Wall and Corner Guards	y
	Other Architectural Woodwork	y
	Hard Landscaping & Structures	y
	Perimeter Fencing	

Building Project Team Members:

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