Institutional [Large] Award
DIAMOND SCHMITT ARCHITECTS

Jury comments: *The high-performance objectives set for this building are particularly significant given its purpose – to provide a living example of the type of building to inspire and train the trades people who will build the next generation of sustainable buildings. Achieving net-zero energy in an equipment-intensive workshop environment is, in itself, a considerable challenge; to do so with a building that is open, transparent and inspiring makes this achievement all the more remarkable.*

1. Looking east to the new addition and courtyard with view into corridor link. Exterior sunshades were provided by **McGill Architectural Products.**

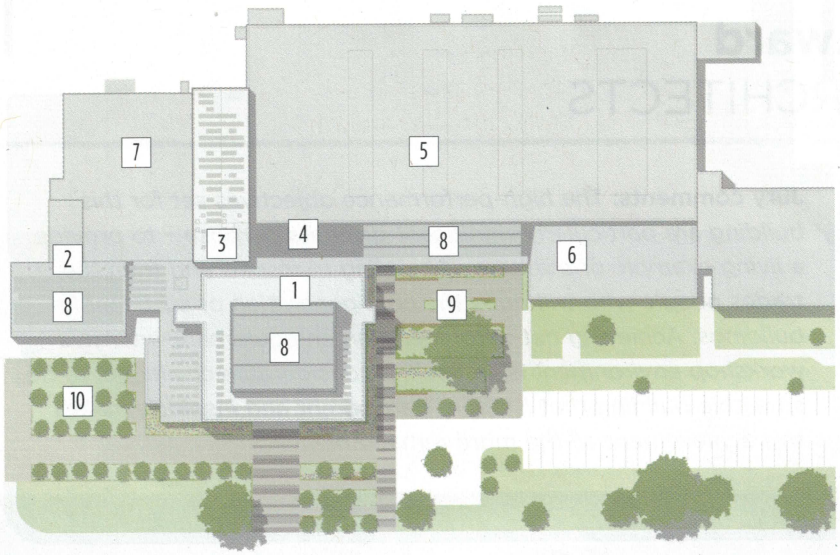
Okanagan College Trades Renewal and Expansion Project
Kelowna, BC

The primary objective of the Okanagan College Trades Renewal and Expansion project was to enlarge and unify disparate elements of the Trades training program on the Kelowna, BC campus and to provide an exemplar of highly sustainable building design for students and future generations of trades workers.

The project comprises two distinct but integrated components: the renovation of 4,180 m^2 of existing trades workshops and the construction of a 5,574 m^2 addition. The three-storey addition frames a new courtyard, preserves a mature copper beech tree and positions the Trades Complex much closer to the main road, creating a new public face for the college.

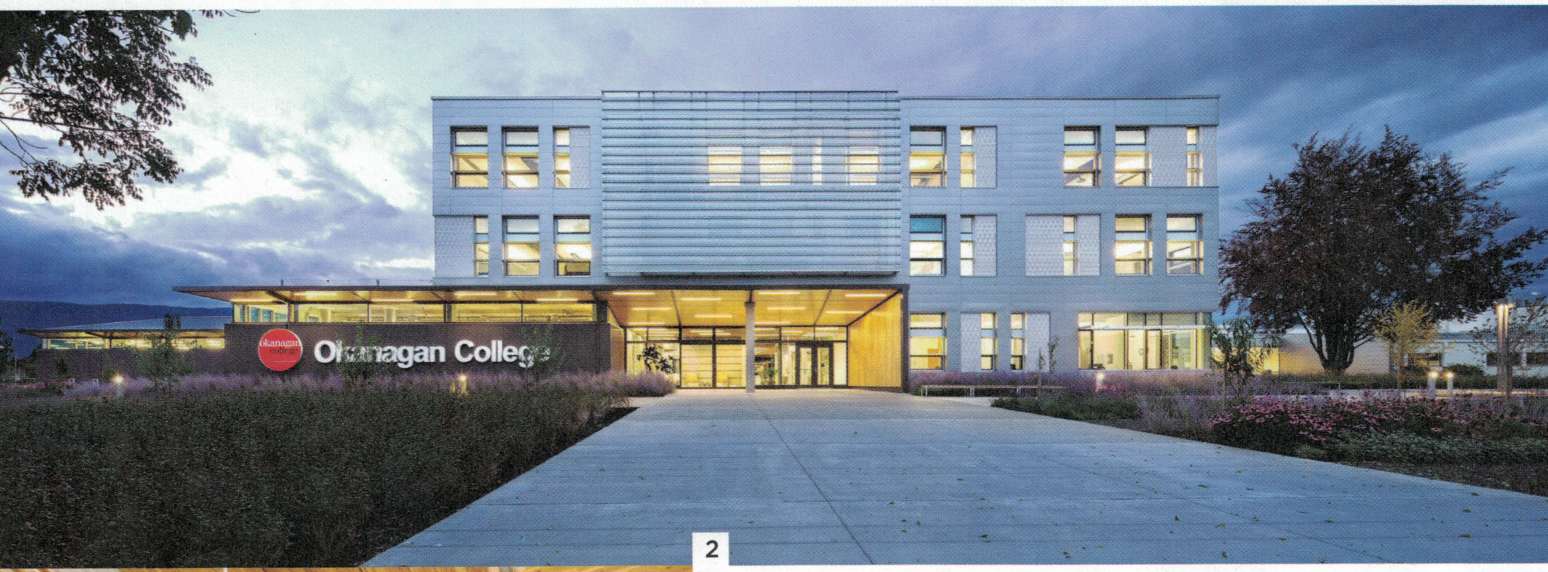
The new building accommodates classrooms, group offices, labs, trade shops, a café, as well as student social and study space for the campus as a whole. The ambitious sustainable design targets were a driving force for the project. They include achieving Living Building Challenge petal certification including Net Zero Energy, LEED Platinum for the new addition, and LEED Gold for Existing Buildings Certification (LEED EB:O&M) for the renovation.

The application of bioclimatic design principles was critical to achieving the ambitious energy targets. These principles informed the orientation, footprint and massing of the building and maximized the potential for capturing solar energy and minimizing the need for conventional mechanical and electrical systems.



Site plan

1. New trades building
2. New sheet-metal shop
3. New plumbing shop
4. New building link
5. Renovated trades shops
6. Renovated classroom block
7. Existing autobody shop
8. Photovoltaic array
9. Courtyard
10. Almond tree grove



2
3

2. The south main entry. Steel cladding 7/8-in. corrugated profile supplied by **Vicwest.**

3. The central three-storey atrium brings daylight into the core and assists with natural ventilation. **Alumicor** supplied the operable windows 5000 Series Phantom Vents, 2300 Series skylights, and 2600 Series curtain walls.

PROJECT PERFORMANCE

Energy intensity (base building) = 17.7KWhr/m²/year

Energy intensity (process) = 19.3KWhr/m²/year

Energy intensity reduction relative to reference building under MNECB = 51%

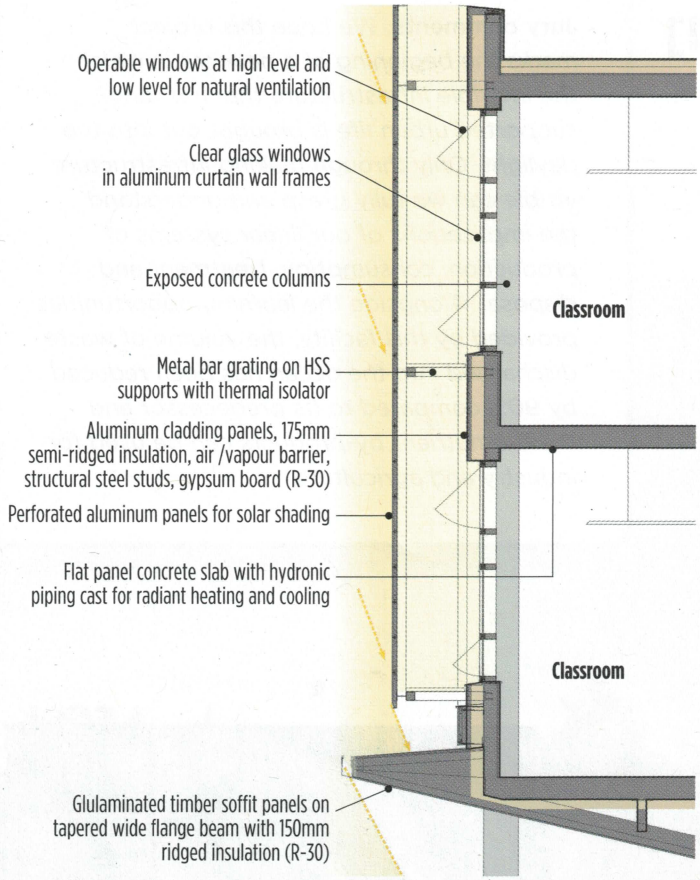
Water consumption from municipal sources = 2,935litres/occupant/year

Reduction in water consumption relative to reference building under LEED = 35%

Recycled material content by value = 25%

Regional materials (800km radius) by value = 32%

Construction waste diverted from landfill = 81%



Partial wall section at main entry

PROJECT CREDITS

CLIENT Okanagan College
ARCHITECT Diamond Schmitt Architects
ASSOCIATE ARCHITECT David Nairne + Associates
CIVIL ENGINEER True Consulting
ELECTRICAL ENGINEER Applied Engineering Solutions
MECHANICAL ENGINEER AME Group
STRUCTURAL ENGINEER Fast+Epp
COMMISSIONING AGENT I Design
SUSTAINABILITY Integral Group
ENVELOPE CONSULTANTS RJC Engineers
GENERAL CONTRACTOR PCL Constructors Westcoast Inc
LANDSCAPE ARCHITECT Phillips Farevaag Smallenberg
BUILDING CODE LMDG Consultants
COST CONSULTANT Quantity Surveyors Ltd
PHOTOS Ed White Photographics

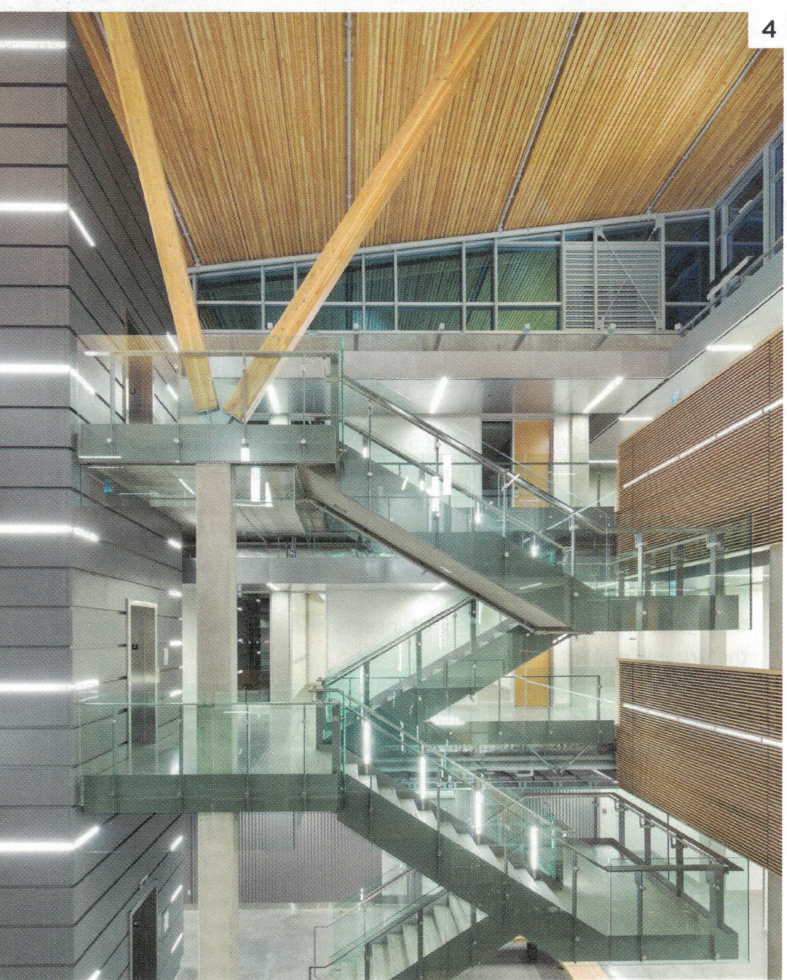
The addition is configured around a central three-storey atrium that brings daylight and natural ventilation into the middle of the plan. A pop-up wood roof with extensive clerestory glazing brings daylight into the core, and its southward slope maximizes north-facing windows and eliminates heat gain and glare. Automated vents within this glazed area, in conjunction with operable windows at ground level, create a natural ventilation chimney which is also used for night cooling in the summer. A green light/red light system indicates to occupants when windows should be opened to further optimize cooling.

Perimeter placement of classrooms and shared staff offices provides daylight, views and natural ventilation through high- and low-level operable windows. The typical classroom and office module is 7m deep, bringing 75% of program space in proximity of an operable window.

These strategies help achieve the Living Building Challenge standards for the 'Civilized Environment', 'Healthy Interior' and 'Biophilic Environment' imperatives. Occupancy sensors and daylighting controls along with 100% LED lighting contributed to a 48% reduction in overall lighting power density compared to the ASHRAE 90.1-2007 baseline.

The problem of meeting the energy-intense technical requirements of the trades shops and labs while at the same time achieving the sustainability targets was solved by first examining in detail how the program spaces would be used, then inputting the information into a series of energy models, and finally analyzing the data to determine how to achieve the most optimal results.

The fact that a trades facility with its high energy-use requirements for power tools and equipment can achieve this level of energy self-sufficiency sends an important message that a sustainable future is no longer a distant prospect, but is attainable now.



4. The stair within the atrium.