



## A LIVING LABORATORY – FALL 2010

It's probably impossible for most of us to imagine a building that leaves no environmental footprint.

At the Penticton Campus of Okanagan College, a building is under construction that will have a small environmental footprint, but will leave a big impression on the city, the College, and the building community throughout the province.

When it opens in April 2011, the Centre of Excellence for Sustainable Building Technologies and Renewable Energy Conservation will be one of most innovative and sustainable facilities in the world.



**Centre of Excellence – Okanagan College Penticton**

Designed by RFABC Associate Member CEI Architecture Planning Interiors, with support from an integrated design team, the 7,085-square-metre facility features classrooms, a gymnasium, offices, workshops, social gathering spaces and more. Its mandate is to train the next generation of trades people in sustainable

building practices, and will also serve as a valuable resource for the community by facilitating the development and application of alternative and renewable energy. Space is set aside in the building for an innovation technology incubator, in which entrepreneurs in green building technology can test and develop new ideas in cooperation with faculty and students.

Funding was provided through an investment of \$22.6 million from the Federal and Provincial governments as part of the Knowledge Infrastructure Program, and \$5 million from Okanagan College and supporting donors.

### A model of sustainability

From the outset, Okanagan College was motivated to pursue an ambitious sustainable agenda, based on the thinking that there is no better way to encourage sustainable building practices among students and the community than to feature the facility itself as part of the curriculum. In this way, the building will practice what the faculty will teach: an integrated, site-specific approach to sustainable building that aims to reduce energy use, conserve water, and mitigate its impact on the surrounding environment.

The LEED (Leadership in Energy and Environmental Design) model commonly used for public and educational facilities was considered, but the integrated project team opted to pursue the Canada Living Building Challenge (LBC), designed to be the most stringent green building standard in the

world. The Centre of Excellence is registered under LBC Version 1.3, which has six categories and 16 imperatives, all of which must be met for the building to achieve certification.

A *living building* is a building which mimics the efficiencies and environmental intricacies of a living organism. Like a flower or a tree, it uses the elements of its immediate surroundings to survive, thrive and even give back to the environment in which it sits.



**The use of salvaged pine beetle kill-wood is designed into and used extensively throughout the facility**

### **The spirit of teamwork**

Clearly, community-oriented facilities provide a unique opportunity for bold sustainable ambitions. Colleges and universities are where new ideas are

proposed, experiments embraced, and various disciplines are brought together to share in the spirit of learning and discovery. The Centre of Excellence is a testament to this thinking, as the pursuit of such a sustainable agenda would not have been possible without broad support from various contributors, including the school's administration and faculty, city officials, the local community, and a diverse range of design, engineering and construction specialists.

Bringing a *Living Building* to life requires complete integration of building systems, which in turn relies on a cohesive, integrated design team. CEI Architecture was selected for the project in part because of the reputation of our design charrette, which has proven successful on many recreation and post-secondary facilities. The charrette, which took place over three days in June 2009, involved over 40 participants. The process resulted in a workable model for the layout of the building on the site, which became more fully realized over the next several months.

### **Learning from innovation**

The integrated design team recognized that achieving a facility with net-zero energy and water consumption, as required for *Living Building* certification, required a three-pronged approach: conserve, capture and create. Additionally, the design had to be highly adaptable, so that as time passes, new technologies will easily replace old, ensuring relevance and currency with the changing curriculum. All project features have been designed around these realities.

The Centre of Excellence takes advantage of many green building technologies, including sun-tracking light pipes, which can magnify sunlight by a factor of ten, a green roof, thermal mass walls, natural ventilation, day-lighting, and more. Energy will be created by geothermal and solar sources, including the largest photo-voltaic array for a non-utility organization in Canada.

To encourage conservation, energy use will be metered at each classroom, workshop, office and other areas. Real-time energy usage will be demonstrated in each space with simple red/yellow/green indicators and full LED displays showing comprehensive data.



**Usually facilities are designed & built so the building is optimized for the occupants here the occupants will be asked to adapt to the building.**

The Centre of Excellence will be a living experiment in sustainable innovation, and a testament to the power of integrated design. We hope the lessons learned from its design, construction and ongoing operations will educate its students and inspire other communities to follow suit, resulting in a building that lives up to its name.



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