

Kelowna Senior Secondary School



FLOOR SPACE: 15,050 m² (162,000 ft²)
BUDGET: \$ 14.5 million Canadian (\$937/m²; \$89.5/ft²)
BUILDING POPULATION: 1,600 students, 100 staff
(Grades 10 - 12, dual track)
CONSTRUCTION DATES: Completed August 2002
OWNER: School District #23, Central Okanagan
ARCHITECT: Meiklejohn Bevanda Meiklejohn Architects Inc.
ASSOCIATE ARCHITECT: CEI, Architecture Planning Interiors
GENERAL CONTRACTOR: Maloney Construction
PROJECT DIRECTOR/COST CONSULTANT: Spiegel Skillen and Assoc.
STRUCTURAL ENGINEERS: Pomeroy Engineering, Ltd.
MECHANICAL ENGINEERS: Stantec Consulting Inc.
ELECTRICAL ENGINEERS: Atwell Engineering Ltd.

PROJECT NOTES

SITE AND WATER

- **Reduced Auto Reliance:** Bike parking and location near bus transit provide choices that will reduce emissions produced by vehicles driven by school teachers and parents.
- **Rehabilitation:** A portion of the site is a former landfill. Improvements renewed the site and created a vital community asset.
- **Water Efficiency:** Washrooms have low-flow toilets, and electronic urinals.

ENERGY AND ATMOSPHERE

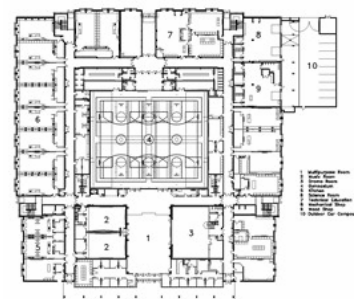
- **Energy Savings:** Low temperature boiler, variable frequency drives in the gymnasium ventilation system, window shading devices, and other energy efficient measures will result in approximately 28% below the Model National Energy Code for Buildings (MNECB) in Canada (roughly equivalent to 18% below ASHRAE 90.1-1999, the reference standard for the USGBC's LEED™ Version 2.1).
- **Economizing:** Temperature and air controls are set to use as little energy as possible, and operation is timed to come just within acceptable range of indoor conditions.
- **Lighting:** Electric light is provided by banks of high-efficiency fluorescent luminaires. Corridor lighting dims during class time, saving energy (and prompting students to return to class).
- **Ease of Maintenance:** Maintenance and HVAC repair personnel can dial into a trouble call area and easily reset equipment as required. The fan coils are located in a maintenance corridor around the perimeter of the gymnasium, providing easy access for maintenance staff.

MATERIALS AND RESOURCES

- **Resource Savings:** The concrete floor is waxed and sealed, acting as a finish, and eliminating the need for carpet or additional material.
- **Compact Design:** The concrete block and steel building is designed compactly, using even dimensions for the overall school design, avoiding unnecessary waste, and reducing the District's construction costs.

INDOOR ENVIRONMENTAL QUALITY

- **Views and Daylighting:** Peripheral classrooms have vision glazing and interior classrooms, as well as second floor hallways, have overhead glazing.
- **Fresh Air:** Every classroom has operable windows and its own four-pipe fan coil moderating its own direct supply of outside air.
- **Diagnostic Capacity:** The ability to measure and trend-log using the building control system allows an immediate printout of the previous 24 hours when a question about the air quality of a space arises.
- **Acoustical Comfort:** Noisier rooms (workshops, dance, theatre, music) are grouped on the first floor. On the second floor, mechanical corridors buffer sound between the gym and classrooms.



INGENIOUS DESIGN SAVES MONEY, MEETS SUSTAINABLE GOALS

The Kelowna Senior Secondary School, an English and French immersion school, is located in Kelowna, British Columbia, nearly 400 kilometers (roughly 240 miles) east of Vancouver. One of the key elements of the design, the fact that it is a perfect square, came out of a desire to keep costs down. The building is essentially a 100 meter by 100 meter square. In order to make this work, and not sacrifice interior lighting quality, the designers placed the two-story school gym in the middle of the square while 34 state-of-the-art teaching and specialty spaces are located at the perimeter on each floor.



This ingenious approach and other innovations allowed the designers to cost-effectively meet the Province’s Green Initiative requirements, the first secondary school in the Province to do so. Because of this, the school won praise at the Council of Educational Facility Planners (CEFPI) Fall 2002 Conference, where the project was on tour.



The area of glazing in instructional spaces is prescribed by Ministry standards. However, glazing in other portions of the building maximize natural light and minimize solar gain. For example, the principal entry façade, which has large areas of glazing, faces east. This orientation minimizes overall solar gain, and the minimal solar gain experienced in morning hours is less likely to cause overheating.

The building envelope was designed to meet budget restraints while maximizing durability and minimizing maintenance costs. For example, the exterior wall is constructed of durable, low-maintenance concrete masonry units. The framing for the glazing systems is anodized aluminum for durability, ease of installation, and future recyclability. The roof membrane is a 2-ply S.B.S. roof system. This is a durable system that also reduces the pollutant emitted during the application of a traditional built-up roofing system.



Acknowledgements: The information used in this case study was provided by the Greater Vancouver Regional District and British Columbia Buildings Corporation. For more information about green building in the region, contact: Green Buildings BC, www.greenbuildingsbc.com, a program of the British Columbia Buildings Corporation and BUILDSMART, www.buildsmart.ca, a program of the Greater Vancouver Regional District. All photographs and graphics are courtesy of Meiklejohn Bevanda Meiklejohn Architects Inc.