ARCHITECTS

Green Building - Sustainable Architecture

"Sustainability means doing things better - not doing without. Right now, Canadians consume too much, and most of it is wasted. Less than 10 per cent of the energy we generate is actually used in the purpose for which it was intended. Most of it goes up in smoke. Our economy is fully one-third less energy efficient than the United States and only half as efficient as most European countries."

*Originally published as a foreword to Sustainability within a Generation: A new vision for Canada by Dr. David Suzuki

The world's buildings are responsible for 40 to 50% of global energy consumption. As our communities become more aware of environmental issues demand for Kyoto compliant buildings will increase. Expect to see buildings that achieve 100% daylight efficiency during daylight hours; buildings that are principally cooled by naturally driven air conditioning systems and innovation in wind driven ventilation with intelligent facade design. Architecture is at the forefront of this challenge. Together we must build through creativity and responsible sustainable design.

Sustainable design with 'Green Architecture' is an evolutionary re-evaluation of construction and design practices by the architectural, building and environmental communities. It's aim is to produce buildings which have lower energy demands, boost employee morale and productivity and are less harmful to the environment. These concerns are not only examined in the construction process but the entire 'life span' of the building. From the initial raw material harvesting and building material manufacturing to the final demolition and disposal of the building itself, a very environmentally responsible project is established.

A building is far more than a commodity, it is a living investment. Care in design now can translate into less upkeep later. Green building design can introduce sustainable concepts that are either equal (cost-neutral) or less than the cost of standard construction methods. When considering the life cycle costs of buildings, the 'green' building energy efficiency excels in all building types. Reductions in energy, water and maintenance costs can usually offset any initial construction cost increases. Government programs such as the Commercial Building Incentive Program (CBIP) through Natural Resources Canada, offer cash incentives for the costs of energy efficiency design in new construction compared to the energy savings return. It's also been shown that 'green' buildings can save owners money in other ways. 'Green" buildings have has a positive influence on employee morale and have been shown to decrease employee absenteeism and increase employee productivity.

The following recent projects by Passa Associates Architects have extensive and advanced sustainable features built into them. They are two school projects completed for the Windsor-Essex Catholic District School Board in Windsor, Ontario, Canada. The pro-active WECDSB has now mandated minimum CBIP compliant energy efficiency for all of their new development projects.

Our Lady of Mount Carmel Catholic Elementary School

Construction Completed April 2004 - Construction cost $4,000,000.00

- CBIP grant awarded due to the project being 40% more energy efficient than the Model National Energy Code for Buildings.
- Annual energy savings of approximately $ 17,000.00 over a standard design structure - amounting to approximately $ 425,000.00 over 25 years. (at current rate cost).
- Classrooms were designed with white, high, sloped ceilings with high windows facing north and large glazing areas with southern exposures for extensive daylighting
- Occupancy sensors used throughout to eliminate waste in lighting costs automatically turn off lights in unoccupied rooms
- Fibreglass framed windows which exceed standard thermal and air infiltration tests
- All new areas have water in-floor radiant heating using existing boilers which provides more comfortable heating for building occupants
- Displacement air use through high level air conditioning ducts will providing fresh air and circulation requirements in conjunction with the heating system for an excellent indoor environment
- Post and beam construction allows future design flexibility with lightweight sound absorption walls able to be relocated for new uses if required
- The first school 'garden roof' installation locally which offers excellent roof insulation and low maintenance while extending the life of the roof membrane and providing environmental benefits by the reduction the 'urban heat island effect' of cities.

St. Christopher Catholic Elementary School

Construction commenced June 2004, completion date August 2005
Construction Cost $4,300,000.00 (Over $300,000.00 Under Budget)

Many of the above mentioned features from the Our Lady Of Mount Carmel School were included in the St. Christopher School project along with these additional features

- CBIP application approved at 59.5% efficiency beyond the MNECB. This approval makes St. Christopher School the most energy efficient elementary or secondary school in the Province of Ontario and 4th best in Canada.
- Annual energy savings of approximately $ 25,000.00 over a standard design structure - amounting to approximately $ 625,000.00 over 25 years. (at current rate cost)
- In-floor radiant heating and radiant cooling installed in new construction (25,000 sf) providing efficiencies in both systems with less required duct work.
- 5,000 square foot garden roof as a showcase for the community visibly showing 'green' and sustainable design while providing cooling.
- Use of recyclable steel structural components, metal siding and high insulation values in all exterior walls and building encapsulation.
- Daylight and occupancy light sensors installed in two storey Entry Atrium and Stairwells.
- Waterless urinals used throughout in both new and existing washrooms.
- Undulating classroom wall facing expressway for sound deflection.