

Interesting Facts:

Energy:

The projected energy output of the four solar panels is 19,800 Megajoules per year; that is roughly equivalent to:

- the energy needed for frying 22,123 hamburgers commercially
- the energy needed for cooking 28,489 spaghetti portions at home
- the energy needed for brewing 12,790 cups (8 oz./180 ml) of coffee

Emissions:

It is anticipated that the projected energy saving could result in reducing 20.5 metric tons of carbon dioxide emissions, which is equal to:

- Carbon sequestered annually by 4.4 acres (1.8 hectares) of pine or fir forests
- total annual carbon dioxide emissions of 6 households in Richmond, BC
- total annual carbon dioxide emitted from heating 8 typical BC homes

Water:

It is estimated that the project's total water use would be reduced by 72,000 litres per year, that is:

- 12,000 toilet flushing (6 L per flush) or approximately 20 months (600 days) of toilet use (5 times a day) for a family of four.
- 528 full bathtubs (136 L per bathtub)
- 9,500 minutes of showering (assuming a shower consumes 7.6 litres of water per minute) or approximately 16 months (475 days) of daily showering (five minutes) for a family of four.



Our Vision

"For the City of Richmond to be the most appealing, livable, and well-managed community in Canada."

Our City recognizes the importance of creating a sustainable community. It is a core strategy for achieving our corporate vision. Working towards sustainability means living within limits, understanding the interconnections and interdependence among the economy, society and the environment, and the equitable distribution of resources and opportunities. Our vision of a sustainable Richmond is a healthy, safe and enriched community with an innovative and prosperous economy and thriving natural systems, sustained for current and future generations.

Completed	2011
Site Area	3,072 m ²
Building Area	742 m ²
Cost	\$4.1 M
Design Team	Architect: HCMA Structural: Fast + Epp Structural Engineers Mechanical: AME Consulting Group Ltd. Electrical: Roy Campbell Ltd. Landscape Architect: Space2Place Contractor: Stuart Olson Dominion Construction Ltd.



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HCMA



Richmond

1: Solar Thermal Panels

The four solar panels on the roof of Steveston Fire Hall preheat water which is then stored in a 450-litre (120-gallon) storage tank at temperatures between 32 to 49°C (90 to 120°F). This water would be further heated for domestic use inside the building but much less energy is required to heat the water to reach the appropriate temperature (60°C).

2: Pine Beetle Wood

The unique design of the project decking consists of solid wood panels made up of stacks of dimensional lumber (2-by-4) entirely sourced from Pine Beetle wood.

3: Ground-Source Heat Pump System

The ground-source heat pump system uses the constant temperature of the earth (~10°C) as a source of heat in winter and boosts it to temperatures needed for use in the building. The system also uses earth's much cooler temperature as a source of cooling in summer.

4: Green Roof

More than half of the total roof area (approximately 360m²) is green roof. While visually appealing, green roofs create natural habitat. They could reduce stormwater run-off because like sponges, they absorb and hold water. The vegetated surface of green roofs significantly reduces heat absorption and mitigates "Heat Island Effect." Green roofs also provide the protection for roof membranes which could be damaged by the sunlight's ultraviolet radiation in long term.

5: Radiant Floor

Ground-source heat pump systems work especially well with lower water temperature requirements of radiant floors (in-floor heating). In addition to efficiency, radiant floors maximize occupant comfort, are silent, provide interior spatial flexibility and improve indoor air quality.

6: Low-Flow Fixtures + Dual-Flush Toilets

The use of water efficient fixtures such as dual flush-toilets and low-flow faucets and shower-heads is anticipated to reduce the building potable water use by 72,000 litres per year.

7: High-Performance Envelop, Cross - Ventilation + Extended Sun Shade Caps

The well-insulated building envelope reduces heat-loss (in winter) and heat gain (in summer). The extensive high-performance glazing provides views and access to daylight for almost all regularly occupied rooms in the fire halls. The extended curtain wall caps act as sun shading and glare control devices while operable windows provide access to fresh air and facilitate natural ventilation.

8: Heat Recovery Unit

The unit extracts heat from the outgoing/exhaust air and uses it to preheat the incoming air.

9: Sustainable Site

Light-colour concrete pavement (as opposed to asphalt) reduces heat absorption and mitigates Heat Island Effect. Landscaping uses no potable water for irrigation. Light pollution is minimized by avoiding interior lighting spillage, up-lighting and light trespassing beyond site boundary. Green screens are visually pleasing and provide seasonal shading (when needed in summer). Rain gardens (and green roof) are used for on-site storm water management.

