

Rideau Residences

Project Description

Last December while the outdoor temperature was in the minus double digits, a fuse in the heating system of Chris Straka's home failed and the system shut down. He neglected to replace it until four days later when his partner Carmen asked if he had lowered the thermostat. The indoor temperature had dropped 3 degrees.

Motivation for the development of the Rideau Residences stemmed from Vert Design Principal, Chris Straka's desire to demonstrate the feasibility of creating high performance buildings in Ottawa's climate using building materials and systems that were readily available in North America - at a cost that is comparable to that of a custom home built using conventional practices and assemblies. In collaboration with Ross Elliot of Homesol Building Solutions, the project's LEED/PH consultant, Vert Design's project team was successful in creating the first residence in Canada designed, built and certified to the Passive House standard.

The building's form was driven by the optimal urban site on which it was built - albeit a very small one. The two unit development rests on a 40' x 40' postage stamp parcel of land, adjoining a neighbourhood street with frequent bus service and a public space that overlooks the Rideau River.

Although the building is an unabashedly modern addition to a neighbourhood that prides itself of its architectural heritage, the materials used on the exterior are typical of its milieu: red clay brick, eastern white cedar, concrete and steel. The flat roof, front porches and symmetry of the building are in keeping with the predominant typology on the street.

Living spaces are situated within the building so as to maximize southern views over lands protected from future development. Generous glazing is protected with 3' - 4' canopies and exterior roll-down shading. Tilt-n-turn doors and windows have insulated fiberglass frames supporting triple glazing (low E hard coat, argon filled, and thermal edge spacers).

Sleeping spaces lie closer to the ground, while storage, washrooms and circulation are stacked on the north side of the building. A solid maple staircase with open risers facilitates the natural ventilation of spaces, from the walk out basement to the green roof access off the third floor. A dual core heat recovery ventilator with an electronically commutated motor provides continuous ventilation in the heating season.

Extensive use of closed-cell polyurethane spray foam provides high insulation levels in joist and stud cavities, on concrete foundation walls and below the basement slab. Thermal bridging through pre-engineered 2x6 wall panels and 14" roof/canopy joists is mitigated with layers of foil-faced polyisocyanurate rigid insulation. All wood to wood connections in the building are caulked and building envelope penetrations are sealed with foam, caulking and tape to ensure an air tight construction.

No combustion appliances were specified for the home. A constant room temperature is maintained on the coldest days by a ground source heat pump with a hydronic radiant heat distribution system. Efficient appliances like the kitchen's induction cooktop and the LED lighting used throughout the home reduce the electricity budget. Energy produced by the roof mounted photovoltaic system is sold into the Ontario power grid through the province's MicroFIT program.

Additional green design strategies such as the home's rain water harvesting system, the use of Forrest Stewardship Council certified lumber, the use of zero volatile organic compound paints and proximity to a diverse cluster of urban conveniences will all contribute to this LEED Platinum candidate's certification.