

Low-Energy Buildings



Murray Bungalow

Hubley, Nova Scotia

Aging in Place in an Attractive, Energy-Efficient Home

The **Murray Bungalow** was designed to create an energy-efficient and environmentally friendly living space for a senior couple. They were ready to downsize but didn't want to move into a condo, apartment or assisted-living facility.

Boasting extensive use of Passive House techniques, the home is fully accessible and can adapt to future changes in their needs.



Murray Bungalow: Quick Facts

- **Project:** Slab-on-grade bungalow for a retired couple looking to age in place
- **Location:** Hubley, Nova Scotia
- **Development cost:** \$450,000
- **Size:** 153 square metres (1,650 square feet) of indoor living space, plus a three-season sunroom and two-car attached garage
- **Number of bedrooms:** 3 bedrooms + den
- **Number of bathrooms:** 2
- **Development partners:** Passive Design Solutions
- **Construction timeline:** January to July 2014

Source: *Passive Design Solutions*

Photographs by Elemental Photography.
All images courtesy of Passive Design Solutions

“The practicality of Passive House is very appealing to me. As builders, we need to design and construct better buildings, and the way to do that isn’t by adding complex and expensive mechanical systems that need a lot of maintenance. It’s through passive strategies that are focused on conserving energy by improving things like the building envelope, windows and insulation. Passive House is so simple and easy to implement—and the results are so dramatic—it just doesn’t make sense to build houses or buildings any other way.”

- Natalie Leonard, founding partner,
Passive Design Solutions

“We never had a new home built for us, let alone a custom design. We did not know what to expect. [But] our new home is everything we had hoped for, and we are envied by many of our friends and family.”

- Joan Murray, homeowner

Passive House: Better Buildings, Affordable Performance

Passive House is known as a “better building” approach to design and construction. It was pioneered in Saskatchewan in the early 1970s and refined by the Passive House Institute in Germany. Through use of passive techniques, technologies and strategies, the goal is to improve energy efficiency, reduce operating expenses and create a healthier and more comfortable living environment. Instead of relying on complex energy or mechanical systems, Passive House focuses on simple and inexpensive ways to improve performance. Some options include more or better insulation, high-efficiency windows, an airtight building envelope and energy or heat recovery ventilators (ERVs/HRVs).

Murray Bungalow: Key Features

The bungalow was designed and built with the needs of the senior homeowners in mind. It combines a variety of accessibility and adaptability features with a full suite of Passive House elements and techniques, including:

- an RSI-7.4 (R-42) slab-on-grade foundation;
- Truefoam 100%-recycled white foam insulation with low global-warming impact;
- RSI-9.3 (R-53) 2x8 walls with polyiso sheathing to keep moisture out and heat in;
- RSI-18.8 (R-107) blown cellulose and wood truss roof to prevent heat loss and help save energy;
- a ducted heat pump to provide energy-efficient “green” heating during Nova Scotia’s long winters;
- a vänEE 2000 heat recovery ventilator (HRV) that’s 35% more efficient than traditional ventilation systems to create a comfortable and thermally stable living environment; and
- roof-mounted solar panels to cut utility costs and provide a reliable supply of no-cost renewable energy.

The completed home will use **85% less heating energy** (and **70% less total energy**) than a traditional bungalow. This could save the homeowners from \$2,700 to \$3,000 on their energy bills each year. At that rate, the upfront investment could be recovered in as little as seven years.

The developers also used only **locally made or available materials**. This helped to further reduce the cost and footprint of the project, while making it easier to gain buy-in from the local tradespeople and suppliers.



Further Information

Passive Design Solutions: www.passivedesign.ca

Passive House Canada: www.passivehousecanada.com

Passive Buildings Canada: www.passivebuildings.ca

Canadian Passive House Institute: www.passivehouse.ca

CMHC research report *Passive Approaches to Low-Energy Affordable Housing – Literature Review*:
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/2017/RR_Passive_Approaches_to_Low_energy_Affordable_Housing_Projects.pdf

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Printed in Canada
Produced by CMHC

28-02-18

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