

# Low-Energy Buildings



## Cote Bungalow

East River, Nova Scotia

### A “Bungalow on a Budget” for a Passive House Devotee

The passive house approach to homebuilding is becoming increasingly popular across Canada. As it does, many of the housing professionals who have championed the approach in their work are using what they’ve learned when they build their own homes.

The **Cote Bungalow** in East River, Nova Scotia, is affectionately known as the “bungalow on a budget.” A tradesperson designed and built it to cut his monthly energy bills as much as possible—and this, without sacrificing comfort or having to come up with a huge upfront investment.



#### Cote Bungalow: Quick Facts

- Project: Slab-on-grade, single-family bungalow
- Location: East River, Nova Scotia
- Construction cost: \$212,000
- Size: 132 square metres (1,425 square feet)
- Number of bedrooms: 3
- Number of bathrooms: 2
- Construction timeline: September 2014 to March 2015
- Development partners: The homeowner and Passive Design Solutions

Source: *Passive Design Solutions*.

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

*“Passive homes are sometimes mistakenly seen as being only for the ‘rich and famous’. With this project, we wanted to show that you could build a beautiful, comfortable and extremely energy-efficient home using Passive House techniques, at a price any homeowner could afford. This is one of the least expensive houses we’ve built to date, proving that very high levels of energy efficiency can be realized at a cost that’s comparable to—and in a home that looks just as good as—a regular code-built custom house.”*

- Natalie Leonard, founding partner,  
Passive Design Solutions

*“We can heat the whole house easily and evenly from one armload of wood per day, even in the coldest months of winter. [And] we love the design of this house. It is very functional and easy to keep clean and organized. I would recommend Passive House design to anyone.”*

- Dan Cote, professional plumber  
and 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 adding more or better insulation and high-efficiency windows, reducing or eliminating thermal bridges, creating an airtight building envelope and using energy or heat recovery ventilators (ERVs/HRVs).

## Cote Bungalow—Key Features

Dan Cote, a professional plumber, designed and built this bungalow from scratch for his family. He had already worked on several other passive house projects. His design incorporates a variety of passive and near-passive house features at a relatively low cost. These include:

- RSI-7.4 (R-42) slab-on-grade foundation;
- RSI-9.3 (R-53) 2x8 walls with polyiso sheathing and service wall;
- RSI-17.6 (R-100) blown-in cellulose and wood truss roof;
- wood stove with a radiant slab, to heat the entire home without using any electricity;
- locally made or available materials, to reduce costs, speed up construction and shorten the learning curve for the local tradespeople;
- locally manufactured Truefoam expanded polystyrene insulation glued together on site, as both the formwork and insulation for the engineered slab-on-grade; and
- a Venmar EKO 1.5 heat recovery ventilator (HRV), to ensure a steady supply of fresh air, with 83% of the heat recovered from the exhaust air.

In total, the bungalow is expected to use **83% less heating energy (and 62% less total energy)** than a similar-sized, code-built home. This could translate into **cost savings of around \$2,400 a year.**

Dan also built his home to be **net-zero energy-ready**. His aim was to accommodate a large enough array of solar panels to supply all the homeowner’s energy needs. For this, he set aside sufficient space and pre-installed rough-ins on the south side of the roof.



## Further Information

Passive Design Solutions: [www.passivedesign.ca](http://www.passivedesign.ca)

Passive House Canada: [www.passivehousecanada.com](http://www.passivehousecanada.com)

Passive Buildings Canada: [www.passivebuildings.ca](http://www.passivebuildings.ca)

Canadian Passive House Institute:  
[www.passivehouse.ca](http://www.passivehouse.ca)

Passive Approaches to Low-energy Affordable  
Housing Projects – Literature Review and Annotated  
Bibliography: [ftp://ftp.cmhc-schl.gc.ca/chic-ccd/  
Research\\_Reports-Rapports\\_de\\_recherche/2017/RR\\_  
Passive\\_Approaches\\_to\\_Low\\_energy\\_Affordable\\_  
Housing\\_Projects.pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/2017/RR_Passive_Approaches_to_Low_energy_Affordable_Housing_Projects.pdf)

CMHC Senior Analyst: Sandra Baynes

Writer: David A.V. Elver Communications Inc.



[cmhc.ca](http://cmhc.ca)



©2018, Canada Mortgage and Housing Corporation  
Printed in Canada  
Produced by CMHC

23-01-18

Although this information product reflects housing experts' current knowledge, it is provided for general information purposes only. Any reliance or action taken based on the information, materials and techniques described is the responsibility of the user. Readers are advised to consult appropriate professional resources to determine what is safe and suitable in their particular case. Canada Mortgage and Housing Corporation assumes no responsibility for any consequence arising from use of the information, materials and techniques described.