Achieving Step Code 3 with Natural Gas

Energy Efficiency and Lower Operating Costs

Maple Ridge, BC

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GENERAL OVERVIEW

Building two similar homes in the same subdivision; one standard, the other meeting Step 3 of the BC Energy Step Code. Fernwood Developments had limited experience building energy efficient homes; they understood the concepts but did not usually incorporate them into their homes. Furthermore, it was important to include natural gas equipment since this is a selling feature.

PRO TIP

Completing an airtightness test partway through construction was pivotal in meeting airtightness requirements, as it allowed for leaks to be identified and addressed prior to the dry wall going up. This allowed the home to achieve an airtightness of 1.32 ACH_{50} compared to the required 2.5.

BACKGROUND

FERNWOOD DEVELOPMENTS is a family run business, specializing in both high-end custom and affordable homes. This project was motivated by a desire to build more energy efficient homes and learn more about the Energy Step Code in BC.

HOME PROFILE

Location	Maple Ridge (Climate Zone 4)
Construction	Spring 2019
Size	2,600 ft^2
Bedrooms	4
Bathrooms	4
BC Energy Step Code Level	
Targeted	Step 3
Achieved	Step 3

THE SOLUTION

The builder focused a lot of attention on the building envelope and ensuring a continuous air barrier. They opted to use an exterior sheathing membrane as the primary air barrier (instead of typical poly on the interior) since it allowed for fewer penetrations along the envelope. Discussions with framers and additional supervision were necessary to ensure the strategy was understood and properly executed. Natural gas equipment was incorporated into the project to further reduce operating costs; this included a gas furnace and water heater and gas hookups for a range and BBQ.

GETTING THE TRADES INVOLVED

Fernwood understood what typical tradesmen do on a new construction home and had to actively engage and realign their team. The framer was affected the most as they had a lot of preparation to do prior to framing. For example, ensuring there is adequate sheathing membrane (the air barrier in this case), so that it was continuous and hung over the side of the home.

ENGAGING STAKEHOLDERS

Some stakeholders were skeptical of the approach. This included pushback from trades on the effectiveness of certain upgrades or envelope improvements. However, with coaching and continual engagement with the trades, energy efficiency goals can be met without significant additional investments.

"The owner of a more efficient home will benefit because it's more comfortable to live in, costs less to operate, and is generally quieter"

Corey Siemens, Fernwood Developments Inc.

PROJECT DETAILS

ENVELOPE

Airtightness	1.32 ACH_{50}
Attic Insulation	R51
Foundation Insulation	R22
Under Slab Insulation	R11.5
Wall Construction	2x6
Wall Insulation	R22
Window/Wall Area	22.9%
Windows	Double pane, low-e, U2 - U2.7

MECHANICAL SYSTEMS

Space Heating	Condensing gas furnace with VFD motor (Amana 97% AFUE)
Cooling	Roughed-in
Ventilation	Balanced fans
Water Heating	Condensing gas tankless water heater (Navien 0.97 EF)
Other Gas Equipment	Natural gas fireplace, hookups for BBQ and range

LOADS, COST & REBATES

Heating Load (TEDI)	31 kWh/m² per year
Mechanical Load (MEUI)	42 kWh/m² per year
% More Efficient than Home Built to BC Building Code	25.4%
Incremental Cost	$8,000 (2% more than the similar home in the same subdivision built to BC Building Code)
FortisBC Home Performance Rebates	$2,500

FortisBC Energy Solutions Managers are here to help. Contact us to discuss your next new construction project. www.fortisbc.com/energyteam

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