

Step 3, Hassle-Free:

How homebuilders are cost-effectively delivering on the energy-efficiency requirements of the BC Energy Step Code

Case Study: Victoria

ENERGY
STEPCODE
BUILDING BEYOND THE STANDARD





CASE STUDY: Bowers Residence, Victoria

Modernity meets efficiency in a highly efficient, furnace-free and airtight house, built to last with insulated concrete forms



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BUILDER:
Bill Bowers, owner/builder
Years of Experience: 15

“ We have a better understanding now of how to create buildings that perform better with lower operating costs, and lower greenhouse gas emissions. We can all play a role in helping to create a better future. - Bill Bowers

A look inside a typical Step 3 Home

Six Proven Strategies

Builders can meet Step 3 by paying attention to details, adding insulation, and carefully planning mechanical systems.



The Six Strategies that cost-effectively boost performance

1. BOOST INSULATION

To reduce heat loss, increase insulation in walls, floors, roof, and foundation.



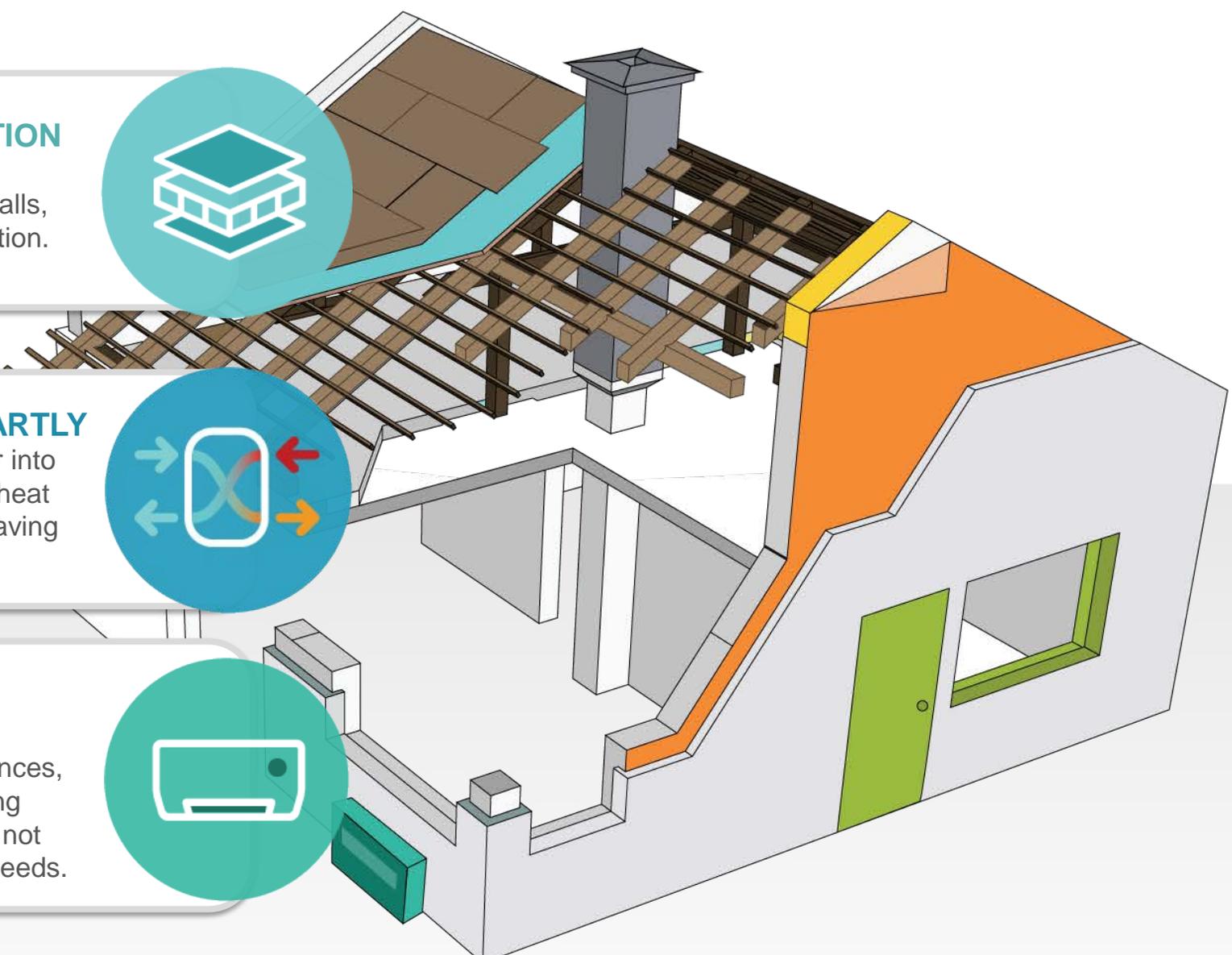
2. VENTILATE SMARTLY

Bring plenty of fresh air into the home and recover heat from the exhaust air leaving the building.

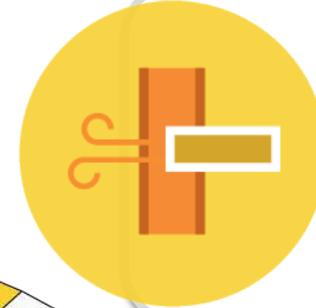
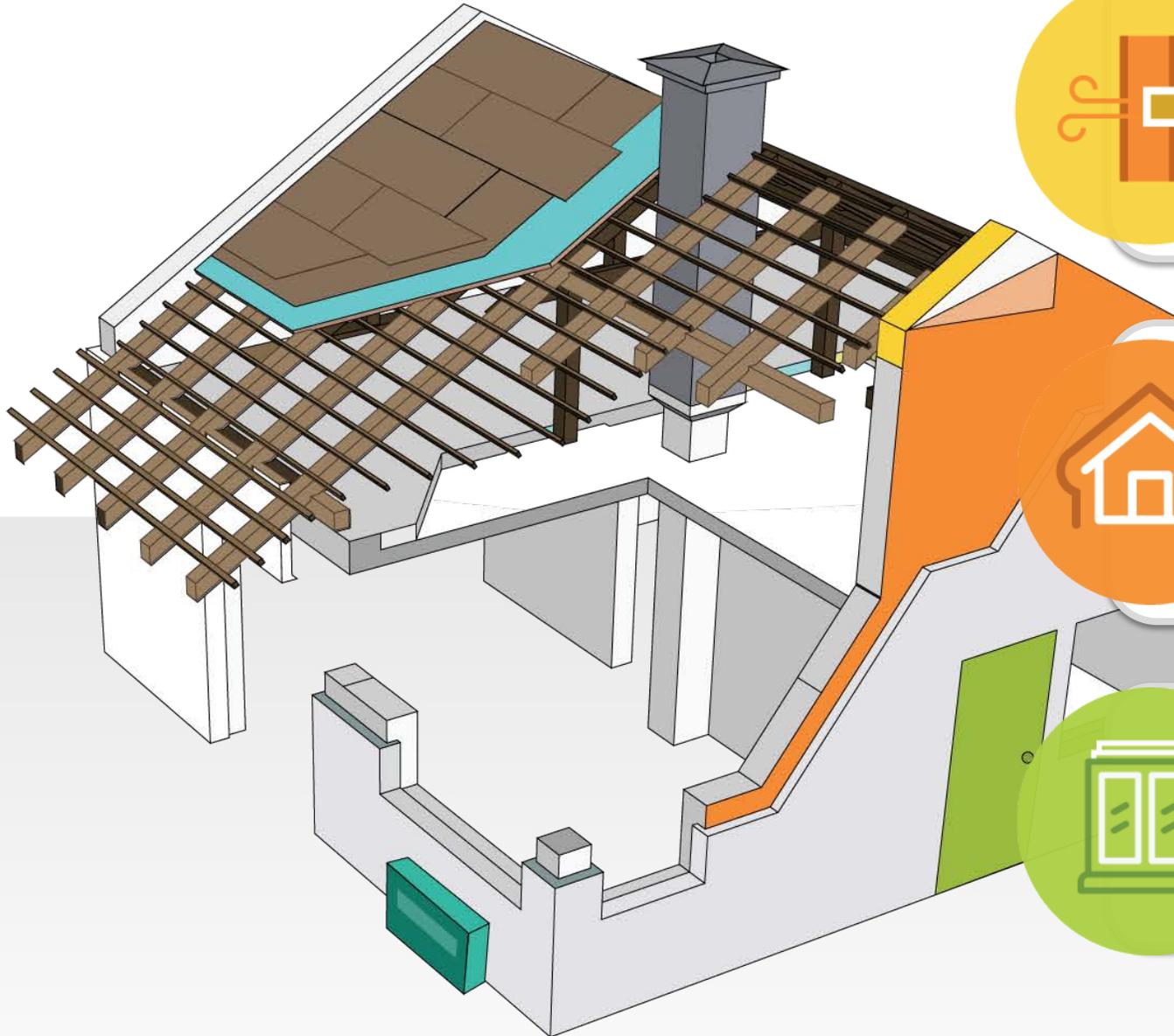


3. MIND YOUR MACHINES

Specify efficient appliances, and ensure your heating system will meet – but not exceed – the home's needs.



The Six Strategies that cost-effectively boost performance



4. MINIMIZE THERMAL BRIDGES A break in your insulation acts like a bridge that carries heat straight out of the house. Take care with corners, junctions, gaps and studs!

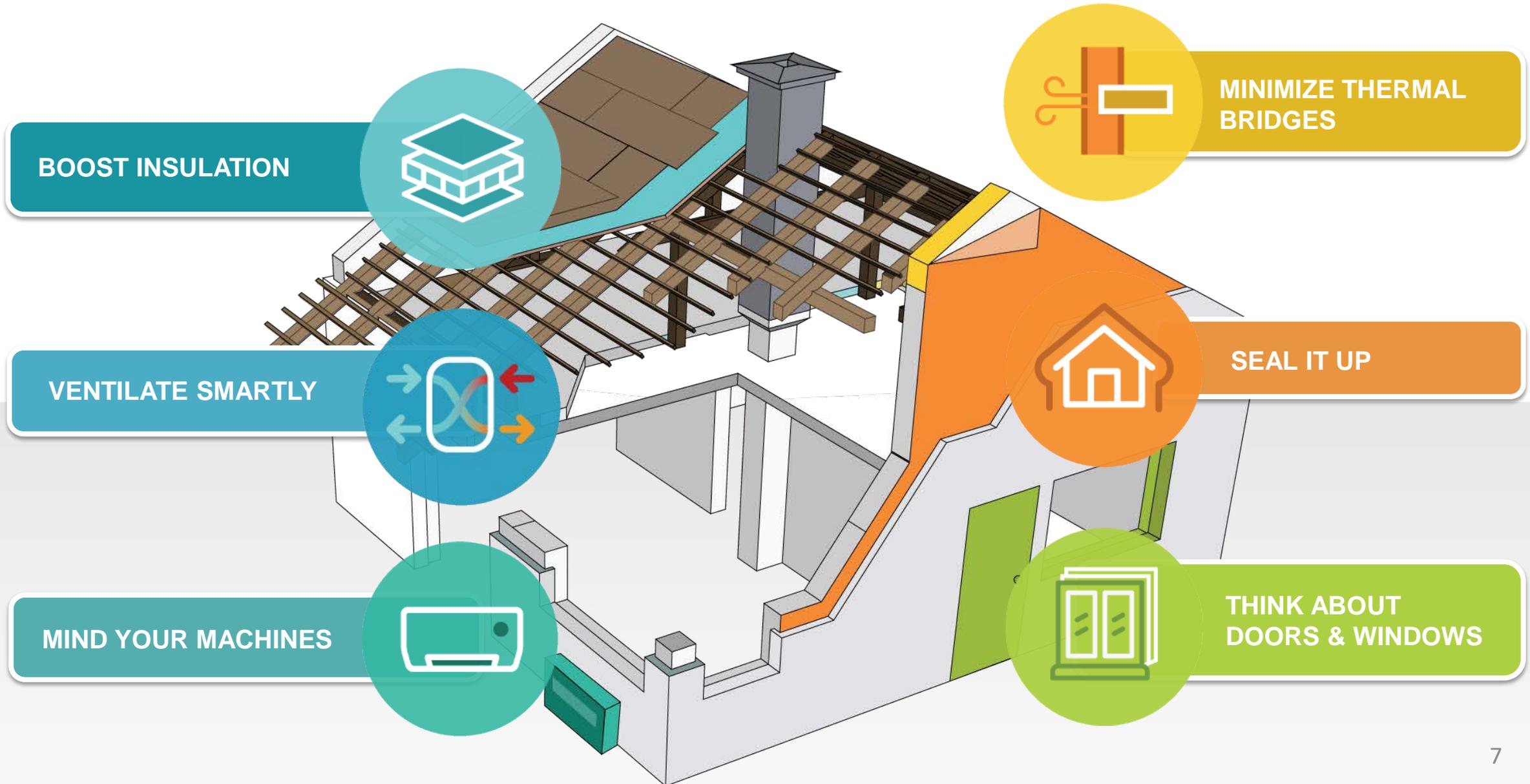


5. SEAL IT UP Air leaks are heat leaks. Wrap the home tightly, taking care to seal around ducts, pipes, fixtures, and wires that pass through walls, ceilings, and roof.



6. THINK ABOUT DOORS & WINDOWS Carefully consider their energy performance, size, and location.

The Six Strategies that cost-effectively boost performance



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2% above
*costs to build to the energy
efficiency requirements of
the BC Building Code*

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Project type: Single-family detached home
Project size: 2,505 square feet
Build cost: \$551,100, or \$220/square foot
Step achieved: 4

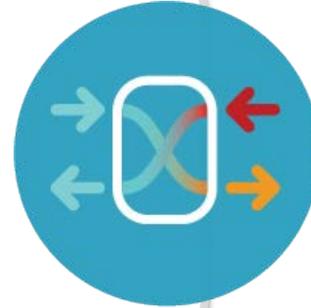


“ As a building-industry professional, Bowers had access to industry pricing, and invested a lot of sweat equity. He also saved \$12,500 by not installing a furnace.

CASE STUDY: Bowers Residence, Victoria

VENTILATE SMARTLY

In a home this tightly sealed against heat loss, proper ventilation is a must. Bowers specified a **vänEE R2000 heat recovery ventilator**—a machine that's been manufactured in Quebec for more than three decades. "We ventilate everywhere, including our crawl space," he says.



SEAL IT UP

There's little risk that the cable guy will casually punch a hole through an exterior wall; they're made of concrete. Picture a **33-foot-high vertical sandwich of styrofoam and concrete**, poured in three layers and running from foundation to roof, forming an airtight R28 rampart. This home's air tightness clocked in just over 1 air change per hour. An typical new home would score a far-leakier 4 or 5.



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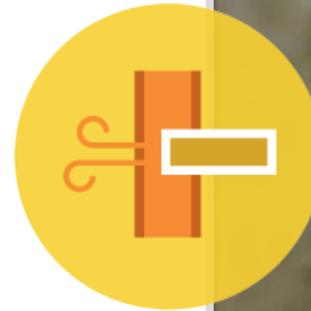


MIND YOUR MACHINES

Heating contractors initially estimated \$15,000 for a furnace and ductwork. That's when Bowers brought in an energy advisor, who told him to rip up the quote. "After running his calculations, he said the house would only need 3.5 Kilowatts of heat," says Bowers. In the end, he installed **four small forced-air electric heaters**—and knocked a \$15,000 bill down to \$2,500.

MINIMIZE THERMAL BRIDGES

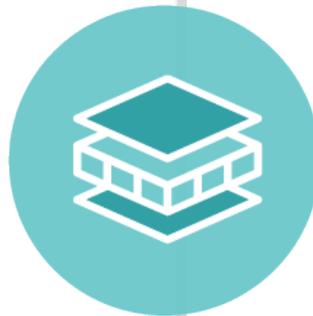
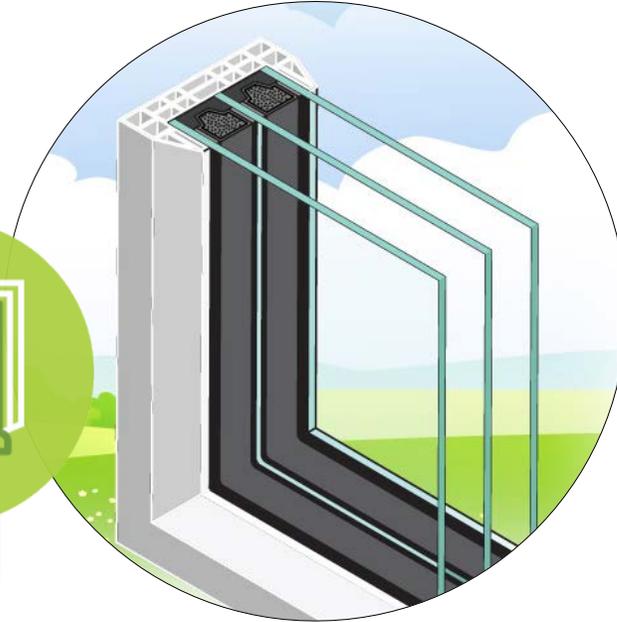
Concrete walls are not only airtight, they keep the heat where it belongs. "When you build with standard stick-frame construction, 40 percent of your insulation R-value goes straight out through the studs," says Bowers. Atop the walls, he **used two stacked strips of silica aerogel** - a high-tech product made in Castlegar, BC that resembles thick rubbery fabric. The aerogel creates a thermal break between the rafters and the concrete.



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THINK ABOUT DOORS & WINDOWS

Bowers ordered **triple-glazed, Low-E windows** from a B.C. company, and worked with his energy advisor to carefully size and place them, dialing down his window-to-wall ratio. “We get sun and a bit of solar gain through big windows facing the east,” he says. Also, Bowers chose custom foam-filled fiberglass exterior doors, with integrated tall skinny windows. Triple glazed, of course.



BOOST INSULATION

Crews lay down **R24 batts in the attic**, added a **blanket of R28 in the truss cavity**, then screwed an inch and a half of R10 foil-faced rigid foam onto the undersides of the roof trusses. That last extra layer of foam really helped the fiberglass do what it does best, and brought the whole assembly up to a nominal R61. Meanwhile, you'll find six inches of foam under the slab.

Thank You!

Questions?

energystepcode.ca