

Step 4 Gets You More:

How homebuilders are delivering cost-effectiveness, comfort, and efficiency to meet the requirements of the BC Energy Step Code

Case Study: Ewert Residence,
Township of Langley



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Style and efficiency come together in this Step 4 home. With strict attention to detail and smart use of readily-available materials, the builder increased energy efficiency with minimal cost premium.

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BUILDER:
Clay Construction Inc.
Larry and Candice Clay
Years of Experience: 18

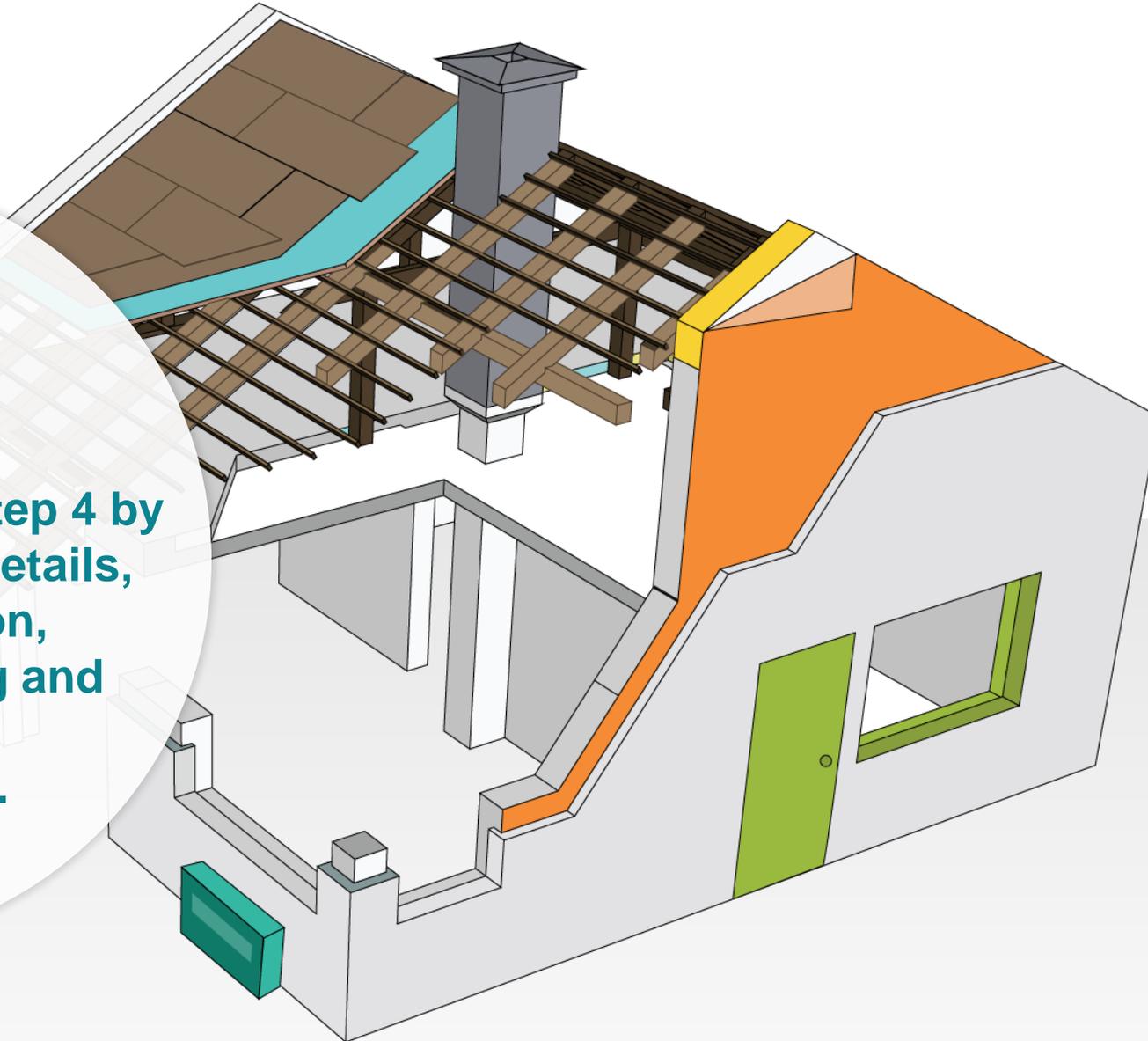


“ *A home that meets Step Code requirements will not only be energy efficient but will also be more comfortable, healthier, quieter and durable.*

A look inside a Step 3 Home

Six Proven Strategies

Builders can meet Step 4 by paying attention to details, investing in insulation, mastering air sealing and carefully planning mechanical systems.



The Six Strategies to improve home performance and delivery maximum comfort and client satisfaction

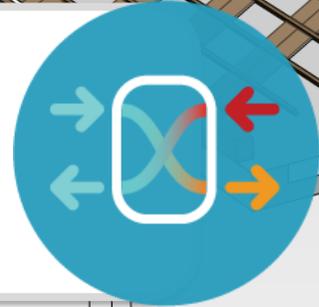
1. BOOST INSULATION

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



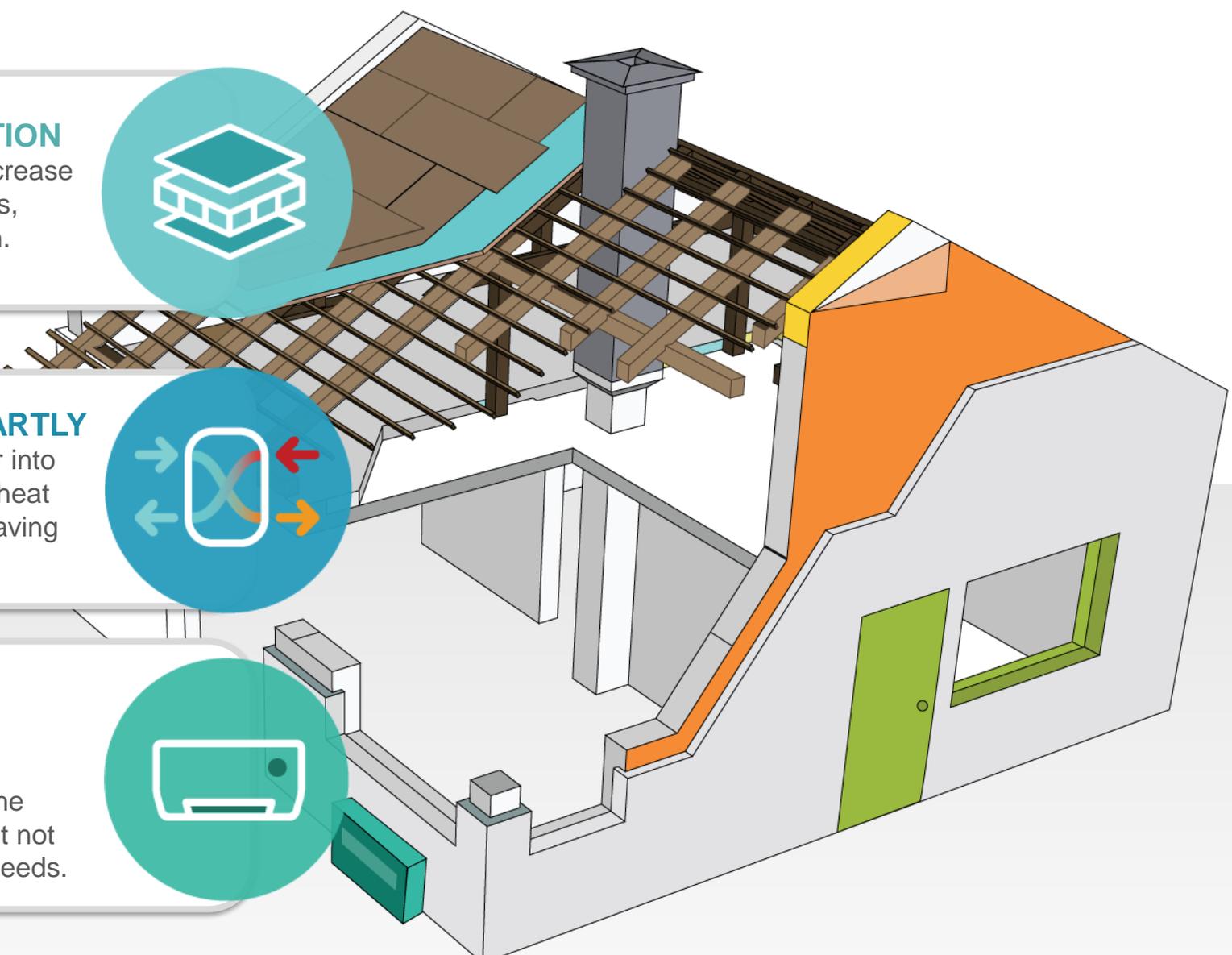
2. VENTILATE SMARTLY

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

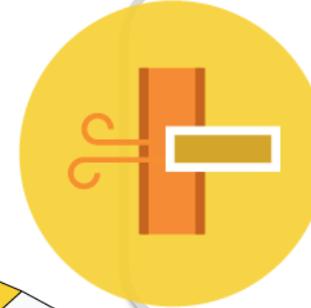
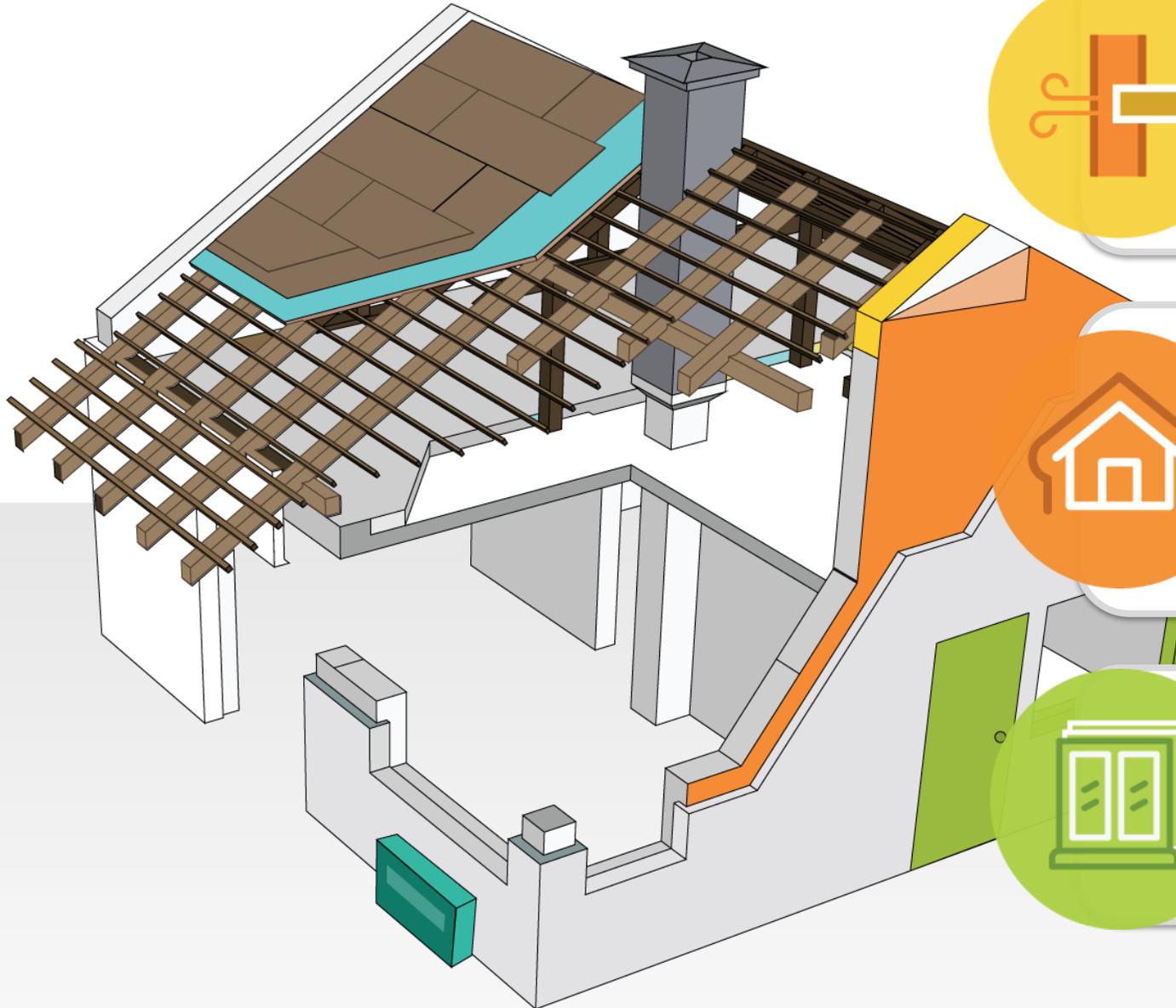


3. MIND YOUR MACHINES

Select efficient heating systems, and ensure the systems will meet – but not exceed – the home's needs.



The Six Strategies to improve performance, comfort and client satisfaction



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!

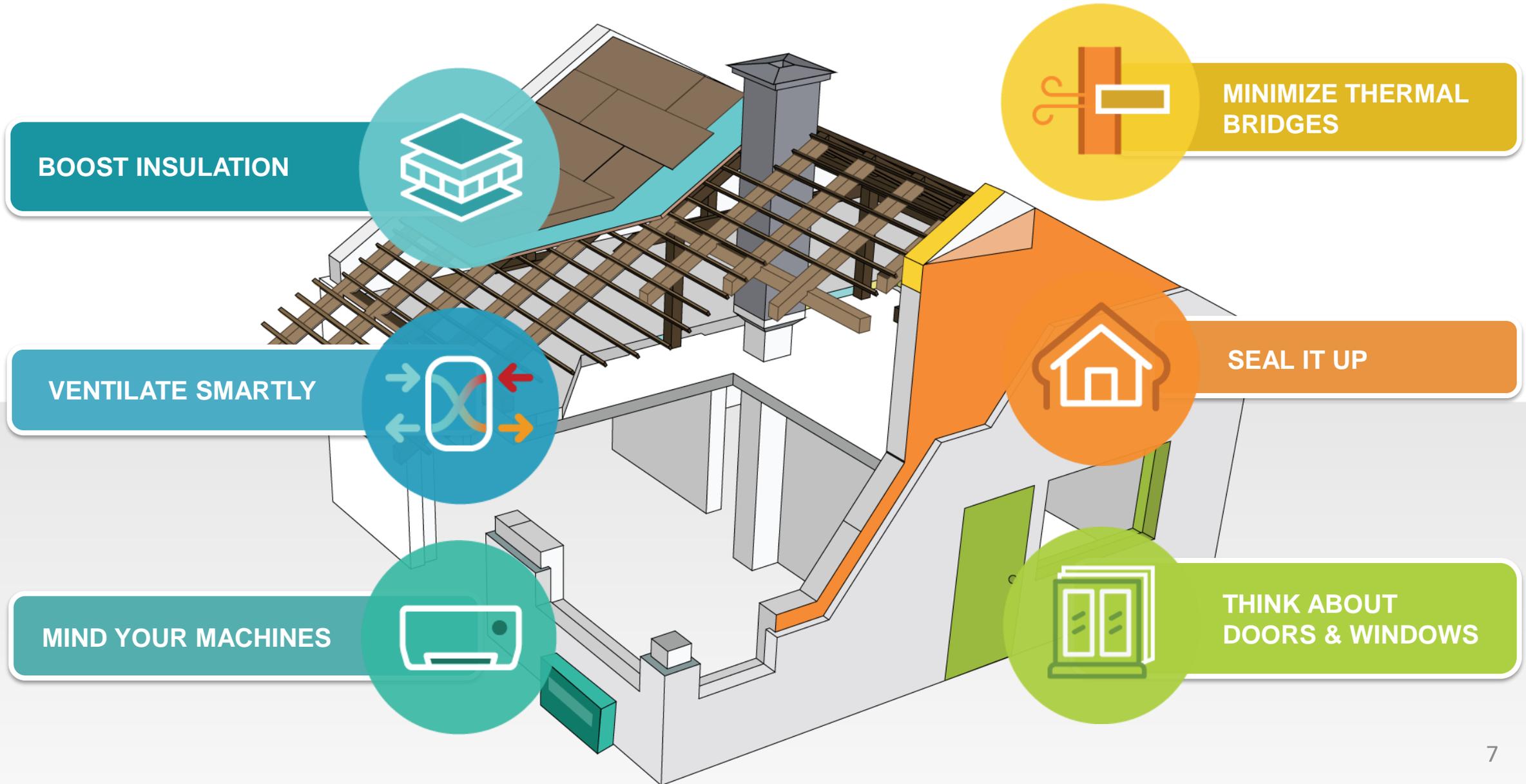


5. SEAL IT UP Air leaks are heat leaks. Start with an air barrier strategy, pay attention to details and take care to seal around all penetrations from interior to exterior.

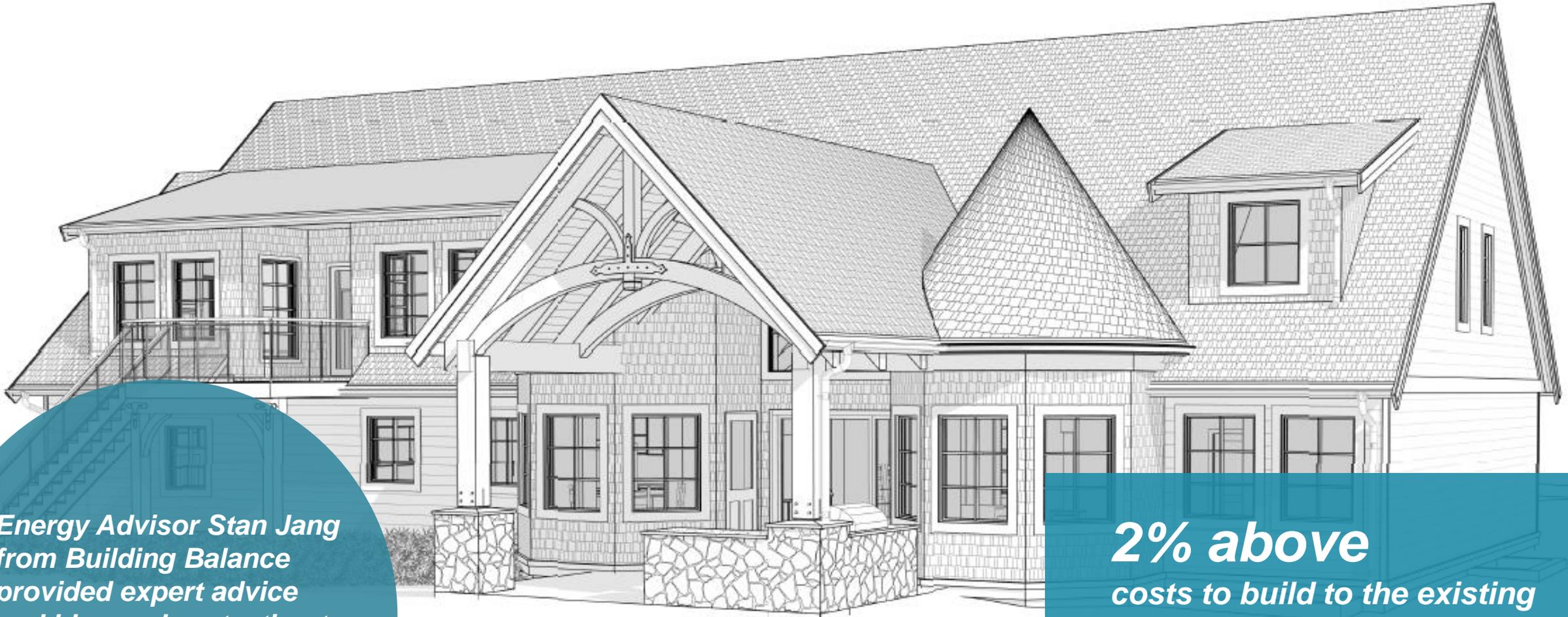


6. THINK ABOUT DOORS & WINDOWS Carefully consider their energy performance, size, and location.

The Six Strategies to improve performance, comfort and client satisfaction



CASE STUDY: Ewert Residence, Township of Langley



Energy Advisor Stan Jang from Building Balance provided expert advice and blower door testing to help maximize efficiency of the home design and construction process

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

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Project size: 7040 square feet

Build cost: \$2,066,637, or \$294 per square foot

Step achieved: 4



“ While there was an increased cost for the spray foam, exterior rigid insulation and windows, cost savings will come through a smaller furnace, operating costs, maintenance and upkeep.

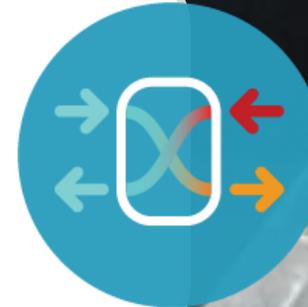
CASE STUDY: Ewert Residence, Township of Langley

SEAL IT UP

Clay Construction used a standard weather barrier and employed open cell spray foam for the wall cavities, ceilings and every joist, nook, and cranny. Vapour barrier paint was used on all interior walls. The ICF concrete foundation was sealed with waterproof membranes as well to prevent air and water movement. These measures along with meticulous caulking and air sealing of stud joints and all penetrations resulted in an impressive **1.03** air changes per hour @ 50 pascals. (A Step 4 home requires 1.50 or less)

VENTILATE SMARTLY

Three **heat recovery ventilators (HRVs)** serve the main house, suite, and basement. These systems are 65% efficient, meaning they capture 65% of the heat from stale air leaving the house, and transfer it to the fresh incoming air. Though energy is continuously used to operate the ventilator fans, the reduction in indoor air pollution and heating costs more than make up for it.

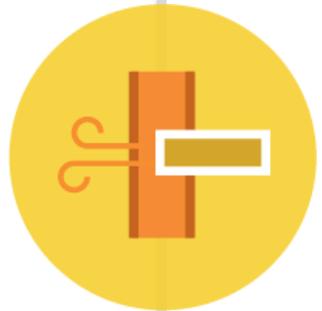


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MIND YOUR MACHINES

A high efficiency natural gas furnace (94% AFUE) provides heating for the main house and basement. This system is complimented by an integrated air source heat pump (8.26 HSPF/16.3 SEER)) that provides a climate friendly heating and cooling alternative. The heating and cooling in the suite is provided by a ductless air source heat pump. Two tankless on-demand natural gas water heating systems provide abundant hot water.



MINIMIZE THERMAL BRIDGES

Clay Construction's insulation strategy for this home was designed to minimize heat loss and thermal bridging. Exterior rigid insulation was used on the exterior walls, reducing thermal bridging at the studs and joints. Insulated Concrete Forms with extra exterior rigid insulation was used on the foundation walls. Spray foam was applied to all interior walls and the underside of the roof to provide a conditioned attic space for mechanical equipment, additional storage space, and to minimize thermal bridging through ceiling joists.



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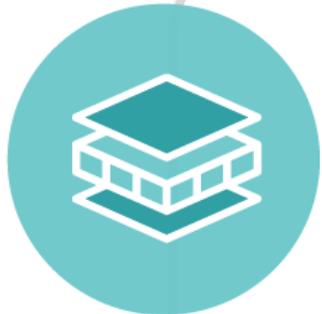
THINK ABOUT DOORS & WINDOWS

Clay Construction uses energy-efficient windows with low-e coatings on both sides and argon-filled panes. The windows they chose have USI-values between 1.19 and 1.36. The crew meticulously sealed around the window units during installation to ensure each unit was air-tight.

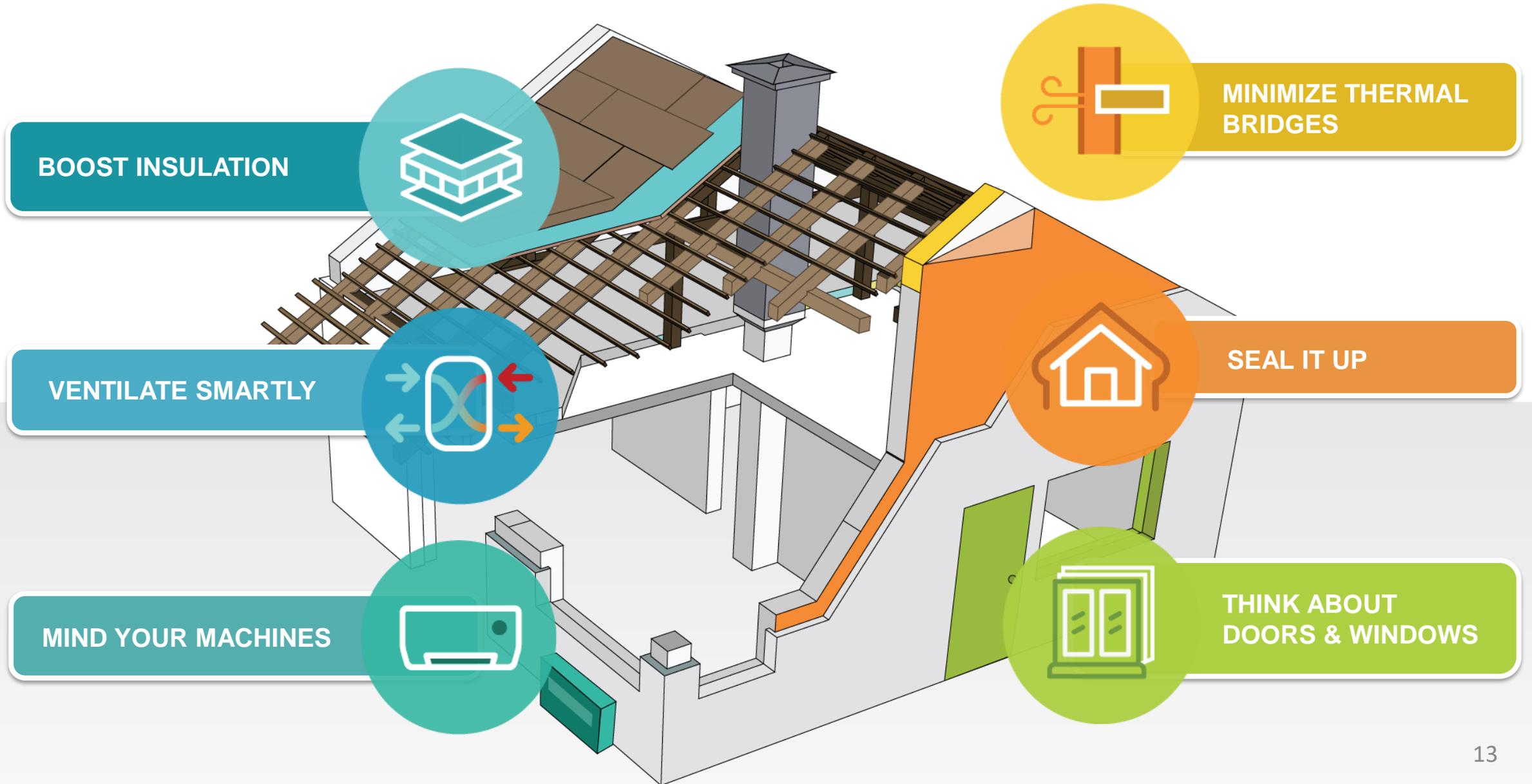


BOOST INSULATION

Clay Construction adds **rigid board insulation to the exterior of the wall sheathing** - adding extra insulating value to the walls without increasing the thickness, and thus the cost, of the framing. The builder also uses open-cell spray foam in the attic up to 10" along with a vapour barrier spray. With its high insulating value, they are able to achieve R40 and provide an effective vapour barrier at the same time.



All Builders can find their unique combination of these Six Strategies to Meet Step Code Targets



Thank You!

Questions?

tol.ca/greenbuildings

energystepcode.ca

clayconstruction.ca