

Residential Exterior Insulation Guide – Energy Retrofits

This process only applies to existing houses, duplexes, semi-detached and rowhouses (Buildings which fall under the scope of Subsection 9.10.15 of the National Building Code of Canada (NBC)). All other buildings should follow the [Commercial Exterior Insulation guide – Energy Retrofits](#).

Purpose of this guide

To encourage the safe and effective installation of exterior insulation, the City of Regina has pre-approved accepted variations to the National Building Code that seek to balance fire risks, building envelope risks, and energy efficiency benefits.

Additional exterior insulation can conflict with fire safety standards, and if not installed properly, can cause unintended problems such as a buildup of moisture leading to mold.

Do I need a permit?

Retrofits Following this Guide: A building permit is not required, provided this guide is followed.

Retrofits Beyond the Scope of this Guide: A building permit and a development permit is required.

Note: New insulation/cladding cannot be installed on the exterior surface of a wall if the new material extends over a property line.

Building Standards' Approach

When an exterior wall is built within 1.2m (4ft) of a property line, the National Building Code of Canada requires additional provisions to help reduce the risk of fire spreading from one property to another.

The accepted variations¹ below are City of Regina accepted alternatives to providing full compliance of the National Building Code of Canada (NBC), *Subsection 9.10.15*, where it is practicable to do so. Owners are encouraged to comply with the prescribed requirements of the NBC.

¹The accepted alternatives have been accepted under NBC Article 1.1.1.1, Division A which prioritizes specific code elements and offers an evaluation process for the cost and benefit analysis when providing renovations to an existing building.

Getting Started

For each wall of your house, measure the distance between the exterior finished cladding surface and the nearest property line (including the thickness of new insulation and cladding). This measurement is a line perpendicular from the house to the nearest property line. Next, determine if any of the new insulation or cladding will be within 1.2m (4ft) of the property line after installation. When you know the distance from the exterior of your new cladding to the property line, pick the appropriate step below to determine the requirements that apply:

Follow Scenario 1 for any exterior walls, including new insulation and cladding, which will be closer than 0.6m (2ft) from the property line

Follow Scenario 2 for any exterior walls, including new insulation and cladding, which will be equal to or greater than 0.6m (2ft) but less than 1.2m (4ft) from the property line

Follow Scenario 3 for any exterior walls, including new insulation and cladding, which will be further than 1.2m (4ft) from the property line

Note: Many homes are built with side walls 1.2m (4ft) or closer to the property line. When this is the case, Scenarios 1 or 2 must be followed. Other walls, like those facing the front or back property lines, are typically greater than 1.2m (4ft) and can follow Scenario 3

Scenario 1

If any portion of a wall is less than 0.6m (2ft) from the property line:

Component	NBC Requirement	City of Regina Accepted Variation
Exterior Insulation	NBC allows combustible or non-combustible insulation (but other requirements would also apply, such as fire ratings and limited window openings)	Non-combustible (mineral wool, glass fiber) must be used to allow for other accepted variations below (relaxations to wall fire ratings and existing window openings)
Cladding		
When attached to wood furring members	Non-combustible cladding (metal, concrete, stucco)	No accepted variation
With no wood furring members	Non-combustible cladding (metal, concrete, stucco) OR Vinyl cladding not more than 2mm thick and with a flame spread not more than 25	No accepted variation
	12.7mm gypsum sheathing required to be installed under vinyl cladding	12.7mm (½in) gypsum sheathing installed under cladding permitted to be waived if the exterior insulation is noncombustible
Wall construction	45-minute fire resistance rated exterior wall required (type X drywall (fire rated) required on the interior surface of the wall)	45-minute fire resistance rating permitted to be waived if the exterior insulation is noncombustible

		Note: Future replacement of the existing <i>interior</i> gypsum board must consider a minimum 1/2" type X drywall (fire rated) to meet the 45-minute rating required by the NBC
	No windows permitted	Existing window openings permitted to remain, including window replacement, if the exterior insulation is noncombustible (Glazing area cannot increase)

Scenario 2

If the distance from the closest portion of a wall to the property line is equal to or greater than 0.6m (2ft) but less than 1.2m (4ft)

Component	Requirement	City of Regina Accepted Variation
Exterior Insulation	NBC allows combustible or non-combustible insulation (but other requirements would also apply, such as fire ratings and limited window openings)	Non-combustible (mineral wool, glass fiber) must be used to allow for other accepted variations below (relaxations to wall fire ratings and existing window openings)
Cladding with or without wood furring members	Non-combustible cladding (metal, concrete, stucco) OR Vinyl cladding not more than 2mm thick and with a flame spread not more than 25 OR Lumber (14.3mm minimum thickness), wood shingles, plywood, hardboard or OSB cladding. These wood-based claddings shall have a conditioned flame spread not more than 25	No accepted variation
	12.7mm gypsum sheathing required to be installed under vinyl, lumber, wood shingles, plywood, hardboard or OSB claddings	12.7mm (1/2in) gypsum sheathing installed under cladding permitted to be waived if insulation is noncombustible
Wall construction	45-minute fire resistance rated exterior wall required (type X drywall (fire rated) required on the interior surface of the wall)	45-minute fire resistance rating permitted to be waived if the exterior insulation is noncombustible Note: Future replacement of the existing <i>interior</i> gypsum board must consider a minimum 1/2" type X drywall (fire rated) to meet the 45-minute rating required by the NBC

	No windows permitted	Existing window openings permitted to remain, including window replacement, if the exterior insulation is noncombustible (Glazing area cannot increase)
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Scenario 3

If all portions of a wall are greater than 1.2m (4ft) from the property line:

The National Building Code of Canada requirements for building faces that are further than 1.2m (4ft) from the property line are much simpler. No fire-resistance rating is required for these walls, and there are no additional cladding requirements. Existing window openings can remain (if window openings are being altered, permits must be obtained). The exterior insulation can be combustible or non-combustible.

Appendix A: Important Design Considerations:

Protection From Moisture

If installing low vapour permeable exterior insulation (less than $60\text{ng}/(\text{Ps}^*\text{s}^*\text{m}^2)$) such as foam board, provided below are general guidelines from the National Building Code of Canada to help reduce the risk of condensation developing inside the wall assembly.

*These guidelines are conservative to account for variability in wall construction.

- For a typical 2x4 inch insulated wall: New exterior foam board should be at least 25mm in thickness to reduce the risk of condensation.
- For a typical 2x6 inch insulated wall: New exterior foam board should be at least 50mm in thickness to reduce the risk of condensation.

Vapour permeance – ability for moisture to release out of the wall assembly.

** The calculation to determine the minimum external insulation thickness for low vapour permeable materials such as foam board is found in Article 9.25.5.2 of the National Building Code. Note that materials with a vapour permeance less than $60\text{ng}/(\text{Ps}^*\text{s}^*\text{m}^2)$ and air leakage less than $0.1\text{ L}/(\text{s}^*\text{m}^2)$ must be used properly to avoid trapping moisture in building assemblies.*

Roof Venting

New exterior insulation may impact the area of existing soffit venting and could negatively impact the existing roof venting system. Roof venting is important for the health of a building and should be evaluated by the homeowner, contractor or designer alongside every home retrofit project.

*These guidelines will help ensure proper ventilation is maintained.

- Step #1: Determine the total insulated area of the roof (take measurements along exterior walls).
- Step #2: Using the insulated roof area calculated in Step #1, next determine the required total vent area for your roof using the applicable calculation below:
 - If the roof slope is 1 in 6 or steeper, divide the total insulated roof area by 300
- If the roof slope is less than 1 in 6, the total roof area should be divided by 150
- Step #3: Determine the minimum venting for the top and bottom portions of the roof (to ensure adequate air movement through the roof space):
 - At least 25% of the required roof venting calculated in Step #2 must be provided at the top of the roof, Therefore, multiple the value from Step #2 by 0.25. This is the minimum amount of venting that must be provided at the top of your roof.
 - At least 25% of the required roof venting calculated in Step #2 must be provided at the bottom of the roof. Therefore, multiple the value from Step #2 by 0.25. This is the minimum amount of venting that must be provided at the bottom of your roof (often met with soffit venting).
- Step #4: Select vents and check that the total sum of the top and bottom venting must meet or exceed the calculation from Step #2, while ensuring that each of the top and bottom venting meets or exceeds the 25% calculation from Step #3.



Note: Other factors may need to be considered for some roof types, see Article 9.19.1.2 for more information or speak with your contractor or designer.

Example Calculation (Roof width of 30 ft by length of 40 ft and slope greater than 1 in 6.):

Step #1: Total Roof Area = 30 ft x 40 ft (measurements taken along exterior walls)
Total Roof Area = 1200 ft²

Step #2: Total Unobstructed Roof Venting Required = Total Roof Area / 300
Total Unobstructed Roof Venting Required = 1200 ft²/300
Total Unobstructed Roof Venting Required = 4ft²

Step #3: Determine Minimum Venting for Top and Bottom
Minimum Venting for Top = = 0.25 x 4ft² = 1 ft²
Minimum Venting for Bottom = = 0.25 x 4ft² = 1 ft²M

Step #4: Select Vents and Check

The specifications for the selected roof vents and vented soffits will be required to calculate the total venting area of the product chosen.

- Check 1: Selected top vents are greater than required by Step #3
- Check 2: Selected bottom vents are greater than required by Step #3
- Check 3: Total top and bottom ventilation is greater than required by Step #2

Protection From Spread of Fire – Vented Soffit

As per Sentence 9.10.15.5.(11) of the NBC, when a roof overhang or soffit is less than 1.2m (4ft) from a property line, the soffit is required to be non-vented to protect adjacent buildings from the spread of fire. Although many structures were built prior to the requirement for soffit protection, owners are encouraged to install non-vented soffits within 1.2m (4ft) of a property line, as long as the minimum required roof venting can be maintained or adjusted to suit.