

Bulletin

Floor Area Exclusions for Improved Building Performance (Thermal Insulation and Rain Screen)

Effective March 14, 2000

Last amended April 23, 2024

Authority: Director of Planning



RELEVANT BY-LAWS AND POLICIES

- Building By-law
- Zoning and Development By-law

BACKGROUND AND CONTEXT

Between 2000 and 2017, City Council amended the Zoning and Development By-law to accommodate:

- increases in insulation thickness, and
- rain screen assemblies in larger buildings.

Section 10.15 of the Zoning and Development By-law allows exclusions from floor area that are intended to offset the additional space needed for these building features. Other regulations that limit building size generally remain in effect, although some of these may be relaxed as noted in section 10.33 for certain zero emission buildings. The *Zero Emission Buildings in R1, RT and RA Districts Bulletin* and the *Larger Zero Emission Buildings Bulletin* provide more information.

1 EXCLUSION OF INSULATION IN RESIDENTIAL BUILDINGS LESS THAN SEVEN STOREYS

Section 10.15.1

These exclusions are designed to accommodate the additional thickness of thermal insulation required by the VBBL in 2014 and 2018 to achieve a wall performance of RSI-3.85 (R-22) effective.

These exclusions do not apply to the non-residential portions of buildings, to tall buildings, or to buildings where most walls have a lesser amount of insulation than specified in the regulations. In these cases, see part 2 of this guide.

Submission Requirements

Please ensure your application includes the following information:

- (a) Wall assembly diagrams with dimensions for each layer of thermal insulation,
- (b) A wall schedule listing total thermal thickness for each wall, coordinated with (a), and

(c) A table for each level indicating the proposed exclusion from floor area, coordinated with (b).

Insulation may be located entirely in the stud cavity, entirely exterior to the stud cavity, or in both locations (split insulation) so long as the combined thickness of insulation exceeds the amount required. Sheathing, cladding, air spaces, concrete, and other elements whose primary function is not thermal insulation are not included in the thickness of insulation when calculating this exemption.

2 EXCLUSIONS OF HIGH PERFORMANCE INSULATION

Section 10.15.2

This exclusion is intended to ensure that the floor area occupied by additional insulation beyond the requirements of the Vancouver building By-law (VBBL) is not lost.

The insulation thickness that exceeds the prescriptive thermal insulation requirement in the VBBL for exterior walls can be excluded to a maximum of 330 mm (13 in.) in buildings of six storeys and below, and a maximum of 179 mm (7 in.) in others. Verification by a Building Envelope Professional (BEP) is required, except as noted below. Sheathing, cladding, air spaces, concrete, and other elements whose primary function is not thermal insulation are not included in the thickness of insulation when calculating this exemption. This exclusion can be combined with the exclusion in part 1 of this guide if the application meets the criteria for both exclusions.

The thickness of insulation that may be excluded can be determined by the following formula:

$$\left(\frac{\text{Proposed thermal performance} - \text{Required thermal performance}}{\text{Proposed thermal performance}} \right) * \text{Total thickness of insulation}$$

For example, a house required to achieve an effective thermal resistance of at least R-22 that proposes an R-44 effective wall assembly with 7.5 inches of glass fibre batt insulation and 2.0 inches of rock wool insulation would use the following calculation:

$$(44 - 22)/44 * (7.5 + 2.0) = 4.75 \text{ inches}$$

This dimension is multiplied by the linear dimension of the wall to determine the amount of floor area that may be excluded.

Where the VBBL requirements specify thermal performance with a maximum Thermal Energy Demand Intensity (TEDI) value rather than a minimum insulation value, the following formula may be used:

$$\left(\frac{\text{Required TEDI value} - \text{Proposed TEDI value}}{\text{Required TEDI value}} \right) * \text{Total thickness of insulation}$$

Passive House projects may use thermal and cooling demand values from a Passive House Planning Package (PHPP) model in place of TEDI values in the above formula, where a BEP confirms that use of the PHPP values will result in equal or better thermal performance.

Submission Requirements

To apply for an exclusion, the following will be required in addition to standard materials:

- (a) A sealed and signed letter from a Registered Professional as defined in the VBBL that recommends the proposed wall types, shows assembly diagrams with insulation dimensions, verifies the RSI or U-value for each wall, and notes the amount of exclusion requested,
- (b) A schedule of wall assemblies indicating materials and dimensions, with reference to applicable standards, and
- (c) A summary table for each floor indicating the requested floor space exclusion for each assembly.

Envelope Retrofits

Insulation added to an existing building as a part of a comprehensive envelope retrofit, and that would otherwise increase the floor area of the building, may be excluded without providing detailed calculations. In these cases, a sealed and signed letter from a Registered Professional that recommends the proposed wall types, shows assembly diagrams with insulation dimensions, and provides the total amount of area to be excluded from floor space, will be accepted in lieu of the materials above. This paragraph does not apply to building additions, which should provide the calculations and submission material noted above.

3 EXCLUSIONS FOR RAIN SCREEN ELEMENTS

Section 10.15.3

This floor area exclusion is intended for larger buildings accommodate rain screen elements in a wall, and to facilitate repairs and replacement of walls on buildings which have been subject to leaks and water damage.

Elements that may be excluded are the exterior cladding and the capillary break. The capillary break or air gap is the space that prevents capillary transfer of moisture and allows moisture to drain. This space is usually located between the interior face of cladding and the next material, which may be a membrane or insulation. Insulation is not excluded in section 10.15.3.

Within walls that exceed 203 mm in total thickness, exclusion may be sought for the area occupied by the rain screen elements as verified by a Building Envelope Professional, to a maximum exclusion of 152 mm. This exclusion can be combined with the exclusions in part 1 and 2 of this guide if the

application meets the criteria for each exclusion. Regulations that limit building size remain in effect, except that for repairs to leaky walls, setback relaxations can be considered by the Director of Planning.

Submission Requirements

To apply for an exclusion, the following will be required in addition to standard materials:

- (a) A sealed and signed letter from a Building Envelope Professional as defined in the VBBL recommending the proposed wall types to control building envelope leaks,
- (b) Wall sections indicating materials, dimensions, and reference to applicable standards,
- (c) Identification of the location and extent of each wall section on building plans, and
- (d) A summary table for each floor indicating the requested floor space exclusion by wall type.