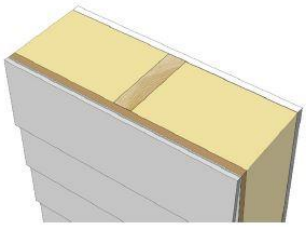
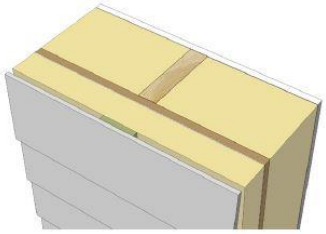
Continuity of Insulation (9.36.2.5.)

For insulation to be truly effective it must have continuity. The Code requires that interior building components that meet building envelope components and major structural members that partly penetrate the building envelope do not break the continuity of the insulation and shall not decrease the effective RSI value by a specified amount. Studs in framing are not considered to break the continuity of insulation where insulation is located in the stud cavities. The diagrams below illustrate the different concepts of insulation continuity and continuous insulation.



Continuity of Insulation

Insulation in the framing cavity is considered to achieve continuity of insulation even though the insulation is not continuous across or behind the stud space.



Continuous Insulation

Insulation that spans across framing components such as wall studs is called continuous insulation. It achieves continuity of the insulation by significantly reducing thermal bridging through the framing.

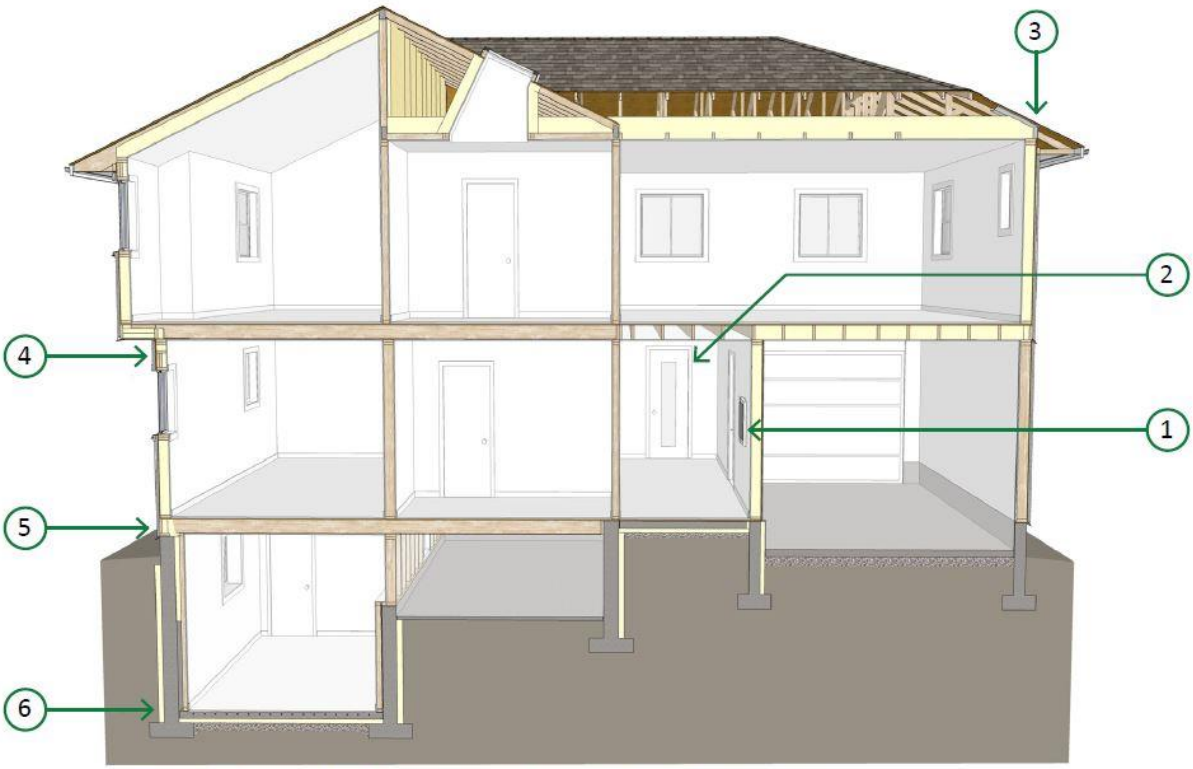
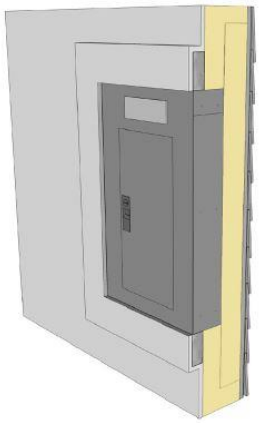
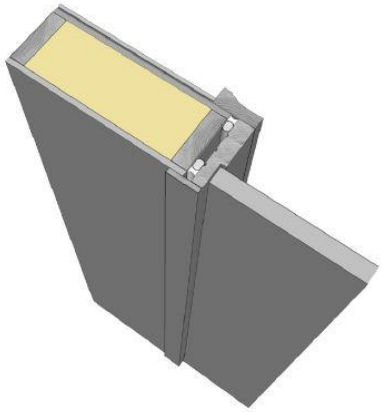


Figure 2: **Typical Problem Areas for Insulation Continuity**



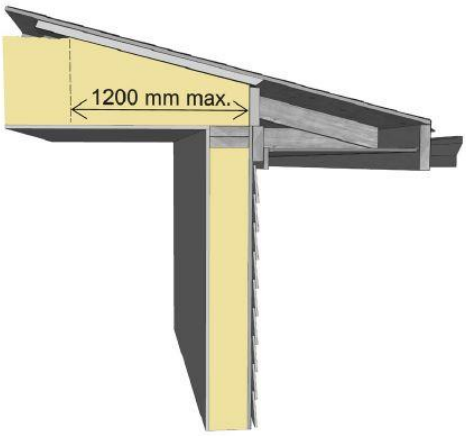
1 Electrical Panel

Mechanical, electrical and plumbing components placed within and parallel to an exterior wall are required to be insulated to the effective thermal resistance required for the wall at the projected area of the component.



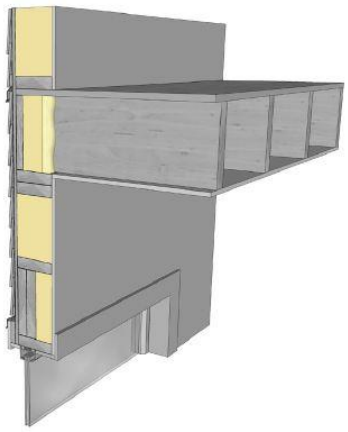
2 Wall to Window or Door Interface

The thermal bridging effect of closely spaced, repetitive joints and junctions between walls and other components like windows and doors need to have the same effective RSI value as the lower of the adjoining components. Additional insulation at the rough opening is typically not required to meet code requirements though is commonly installed. See A-9.36.2.5.(8) for further information.



3 Attic Insulation at Outside Walls

A reduction in the thermal resistance of the attic insulation at the perimeter is permitted, provided the insulation is constrained only by the roof slope and venting requirements, and the minimum thermal resistance value above the exterior wall is at least RSI 3.52 (R-20).

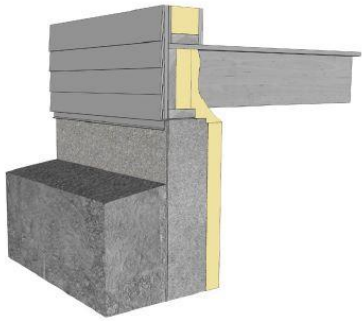


4 Headers and Rim Joists

The thermal bridging effect of closely spaced, repetitive structural members like studs and joists, and of ancillary members like lintels, sills and plates, must be accounted for when calculating the thermal resistance of building envelope assemblies.

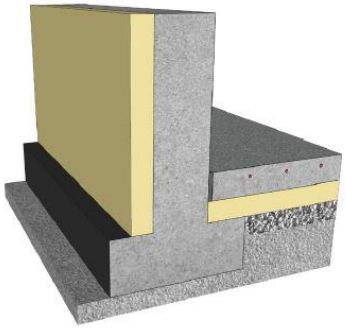
A table for percentage framing for common assemblies can be found in A-9.36.2.4.(1) A. The framing percentages given in this table account for lintels, double top plates, cripples etc. See note 1 of this table for more information.

Exceptions to Continuity | Foundation Walls



(5) Foundation Wall/Rim Joist Transition

The Code considers insulation continuity maintained where a foundation wall is insulated on the inside and the insulation is continued through the rim joist cavity. In the case of hollow-core masonry, continuity is broken and needs to be addressed with the 4X rule. See A-9.36.2.5.(5).

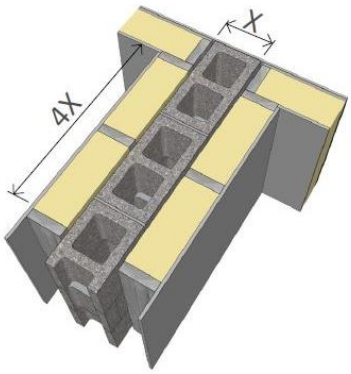


(6) Foundation Wall at Floor Slab

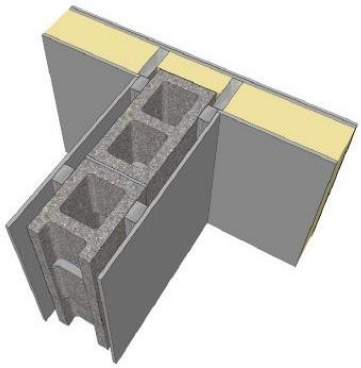
Insulation separated by the foundation wall at the floor slab is not required to be continuous, provided the exterior insulation extends down to the footing. See 9.36.2.5.(9)(a).

Continuity at Fire Separation (9.36.2.5.(2))

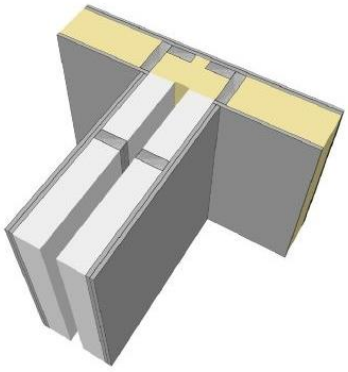
A reduction in insulation level is permitted at assemblies that must penetrate the building envelope such as fire separations and party walls. The 2015 National Building Code shows these examples for insulation continuity in A-9.36.2.5.(a),(b) and (c) .



A masonry fire separation which protrudes through the exterior envelope can be left exposed provided it is insulated along the interior to a distance four times the length left uninsulated.



The thermal resistance of the assembly covering the end a masonry fire separation where it partially penetrates the exterior envelope must be at least 60% of that required for the exterior envelope element.



Wood framed fire separations (containing fire resistant insulation and multiple layers of Type X gypsum board) must be assembled to provide continuous insulation along the exterior envelope.

Credit: BILD Alberta Illustrated Guide for the Alberta Building Code 9.36. Prescriptive Energy Efficiency Requirements for Houses

A-9.36.2.5.(5) Maintaining Continuity of Insulation. An example to which Sentence 9.36.2.5.(5) does not apply is that of a foundation wall that is insulated on the inside and the insulation continues through the joist cavity and into the wall assembly. An example to which Sentence (5) does apply is a foundation wall that is insulated on the outside below grade and on the inside above grade, in which case the distance separating the two planes of insulation is the thickness of the foundation wall.

In the configuration described in Sentence (5), the top of the foundation wall might also be required to be insulated to reduce the effect of thermal bridging through it. Insulation is not required to be overlapped as stated in Sentence (5) in cases where the joist cavities on top of the foundation wall are filled with insulation.

For cast-in-place concrete foundation walls, Sentence (5) ensures that the continuity of the insulation is maintained at every section across the wall.

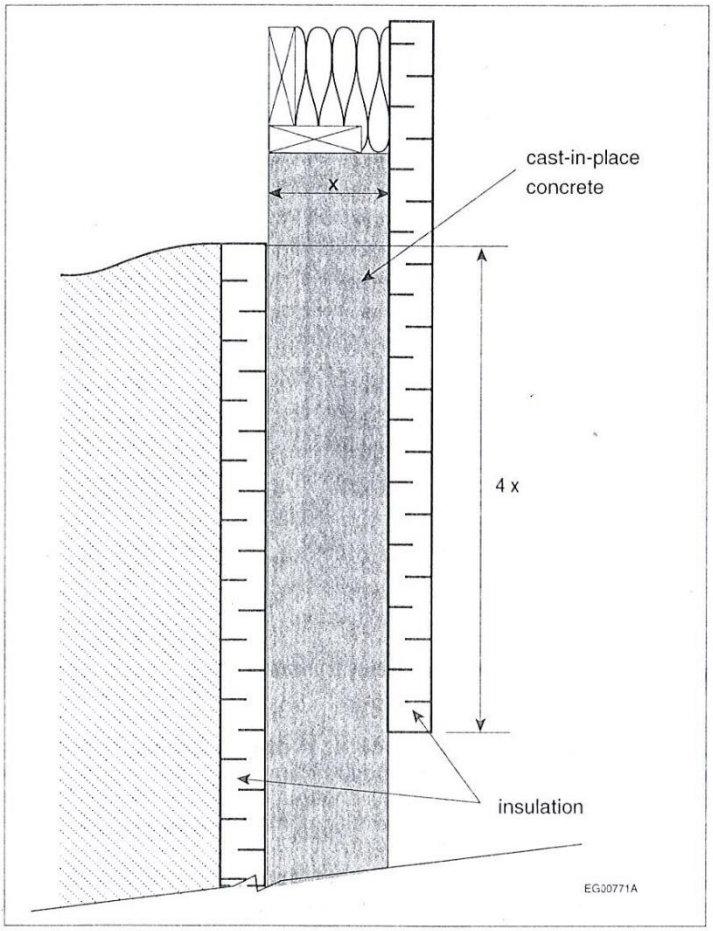


Figure A-9.36.2.5.(5)-A
Application of Sentence 9.36.2.5.(5) to a cast-in-place concrete foundation wall