



9.36.2. Building Envelope

**Module 2
BCBC 9.36.
2014**



9.36.2. Building Envelope Scope and Application

- The walls in skylight shafts are treated like exterior walls. 9.36.2.1.(3)
- Walls less than 60° from horizontal are considered as roof assemblies
- Windows must conform to section 9.7
- Properties of insulation, location and installation of air barriers, and vapour barriers must conform to section 9.25.



Scope and Application

- Any assembly that separates conditioned space from an adjoining *storage garage*, even if the garage is intended to be heated, must be insulated to the requirements for exterior assemblies. 9.36.2.1. (2)



9.36.2.2. Determination of Thermal Characteristics

- Thermal characteristics of materials are determined in accordance with listed product standards
- Log wall R-values must be determined by calculation in accordance with Section 305 of ICC 400, “Design and Construction of Log Structures.”



9.36.2.6. Thermal Characteristics of Above Ground Opaque Assemblies

- Prescriptive path: Requirements vary whether or not an HRV is installed
 - Table with minimum *effective* R-values
 - Look-up tables for most common assemblies, and information on how to calculate others provided in the Appendix



9.36.2.6. Thermal Characteristics of Above Ground Opaque Assemblies

Table 9.36.2.6.A

Effective RSI-values – without HRV

Assembly	Climate Zone (Heating Degree Days °C)				
	Zone 4 < 3,000	Zone 5 3,001 to 3,999	Zone 6 4,000 to 4,999	Zone 7A 5,000 to 5,999	Zone 7B 6,000 to 6,999
Ceilings	6.91 (39.23)	8.67 (49.2)	8.67 (49.2)	10.43 (59.2)	10.43 (59.2)
Cathedral ceilings	4.67 (26.5)	4.67 (26.5)	4.67 (26.5)	5.02 (28.5)	5.02 (28.5)
Walls (2x6 @ 16")	2.78 (15.78)	3.08 (17.48)	3.08 (17.48)	3.08 (17.48)	3.85 (21.86)
Floors over unheated space	4.67 (26.5)	4.67 (26.5)	4.67 (26.5)	5.02 (28.5)	5.02 (28.5)



9.36.2.6. Thermal Characteristics of Above Ground Opaque Assemblies

Table 9.36.2.6.B

Effective RSI-values – with HRV

Assembly	Climate Zone (Heating Degree Days °C)				
	Zone 4 < 3,000	Zone 5 3,001 to 3,999	Zone 6 4,000 to 4,999	Zone 7A 5,000 to 5,999	Zone 7B 6,000 to 6,999
Ceilings	6.91 (39.23)	6.91 (39.23)	8.67 (49.2)	8.67 (49.2)	10.43 (59.2)
Cathedral ceilings	4.67 (26.5)	4.67 (26.5)	4.67 (26.5)	5.02 (28.5)	5.02 (28.5)
Walls (2x6 @ 16")	2.78 (15.78)	2.97 (16.86)	2.97 (16.86)	2.97 (16.86)	3.08 (17.48)
Floors over unheated space	4.67 (26.5)	4.67 (26.5)	4.67 (26.5)	5.02 (28.5)	5.02 (28.5)



Walls above Grade

Code Requirement zone 5 & 6 (3,000 to 4,999 DDC):

Eff. R 2.97 (R 16.86) – with HRV

Eff. R 3.08 (R 17.48) – without HRV

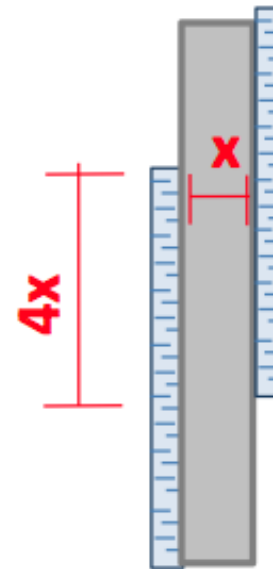
	RSI_{effective}	R_{effective}
2x6 @ 16" R-22 batt insulation	3.11	17.63
2x4 @ 16" R14 batt insul + R-5 rigid insulation	3.19	18.09
2x4 @ 16" R14 batt insul + R-7.5 rigid insulation	3.66	20.78





9.36.2.5. Continuity of Insulation

- Insulation placement can be inside or outside; if there is a cross-over, the over lap must be 4 times the thickness of the wall
 - i.e. for 8" wall, the minimum overlap will be 32"



**General
Requirement**



9.36.2.5. Continuity of Insulation

- 9.36.2.5. (6) mechanical, plumbing or electrical system components (such as pipes, ducts, conduits, cabinets, chases, panels or recessed heaters) within or parallel to wall assembly must be insulated to the same effective insulation level as required for the wall





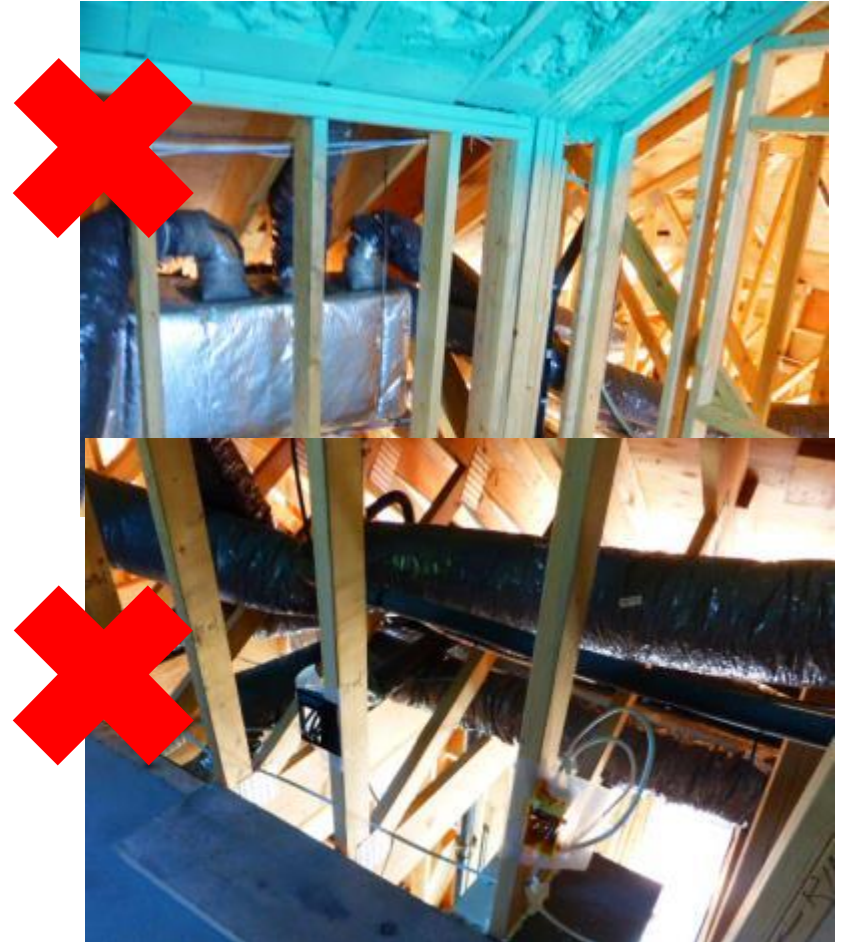
9.36.2.5. Continuity of Insulation

- 9.36.2.5. (7) ducts, plumbing pipes, electrical or communication conduits placed within the insulated portion of a floor or ceiling assembly must have an effective insulation level not less than RSI 2.78 (R-15.78)
- Eg. Pot lights, Bathroom Fan



9.36.2.5. Continuity of Insulation

- Ducts outside the heated envelope must be insulated to the same effective insulation level as required for walls above grade





9.36.2.7. Fenestration, Doors & Skylights

- Fenestration and doors must have a U-value no greater than that in table 9.36.2.7.A, and skylights as in table 9.36.2.7B

	Climate Zone (Heating Degree Days °C)					
	Zone 4 < 3,000	Zone 5 3,001 to 3,999	Zone 6 4,000 to 4,999	Zone 7A 5,000 to 5,999	Zone 7B 6,000 to 6,999	Zone 8 >7,000
Windows & doors	1.80	1.80	1.60	1.60	1.40	1.40
skylights	2.90	2.90	2.70	2.70	2.40	2.40



9.36.2.8. Assemblies In Contact With Ground

- Full height basement wall insulation required
- Top of foundation wall - up to 600 mm above grade is insulated as a foundation wall.
- Appendix table lists typical assemblies



9.36.2.8. Assemblies In Contact With Ground

- Heated floor slabs must be insulated under entire area, including the edges



9.36.2.8. Assemblies In Contact With Ground

- Unheated floor slabs must be insulated min. 1.2m horizontally or vertically down from its perimeter, with a thermal break along edge of slab a min. 50% of required insulation

