

Supplementary Standard SB-12

Energy Efficiency For Housing

November 30, 2009

COMMENCEMENT

Supplementary Standard SB-12 comes into force on the 1st day of January 2010, pursuant to O. Reg. 503/09.

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FOREWORD¹

This Supplementary Standard provides prescriptive requirements to achieve an acceptable air leakage rate and energy efficiency level as an alternative to achieving a rating of 80 when evaluated in accordance with NRCan, "EnerGuide for New Houses: Administrative and Technical Procedures", January 2005. This Standard has been included as a design option in Sentence 12.2.1.1.(3) of the Building Code to recognize the needs of consumers and the building industry for a predictable prescriptive solution. The energy efficiency levels achieved in this Supplementary Standard are intended to meet or exceed, on a systemic basis, the level that would be met by model analogues evaluated against the EnerGuide System.

Sentence 12.2.1.1.(3) currently requires the energy efficiency design of a building or part of a building of residential occupancy within the scope of Part 9 that is intended to be occupied on a continuing basis during the winter months to conform to:

- Subsection 12.3.2.;
- Subsection 12.3.3.;
- Supplementary Standard SB-12; or
- achieve a rating of 80 or more when evaluated in accordance with NRCan, "EnerGuide for New Houses: Administrative and Technical Procedures", January 2005.

After December 31, 2011, Sentence 12.2.1.2.(3) will require the energy efficiency design of a building or part of a building of residential occupancy within the scope of Part 9 that is intended to be occupied on a continuing basis during the winter months to comply with:

- Supplementary Standard SB-12; or
- achieve a rating of 80 or more when evaluated in accordance with NRCan, "EnerGuide for New Houses: Administrative and Technical Procedures", January 2005.

Subsections 12.3.2. and 12.3.3. will no longer be a design option after December 31, 2011.

This Standard contains two options to achieve energy efficiency:

- Select an appropriate prescriptive compliance package from Subsection 2.1.1. of this Standard; or
- Design to the performance compliance method in Subsection 2.1.2. of this Standard.

Regardless of the design option selected, the design must comply with additional provisions in this Standard related to air infiltration of exterior windows and the building envelope.

Supplementary Standard SB-12 does not require conformity assessment (eg. blower door test or labelling) to demonstrate compliance with the Building Code. Nevertheless, the obligation remains with the owner/builder to comply the requirements of this Standard and the chief building official/inspector to perform the mandatory inspections required by Subsection 1.3. of Division C of the Building Code.

¹Unless otherwise indicated, all Building Code references refer to provisions located in Division B of the Code.

SUMMARY OF THE CONTENTS OF SB-12

Chapter 1: General

This Chapter sets out the scope and application of this Supplementary Standard.

Chapter 2: Acceptable Solutions for Achieving Energy Efficiency Compliance

This Chapter contains acceptable solutions for achieving energy efficiency compliance with Clauses 12.2.1.1.(3)(c) and 12.2.1.2.(3)(a) of the Building Code. Conformance with one of the prescriptive compliance packages in Subsection 2.1.1. or the performance compliance method in Subsection 2.1.2. of this Supplementary Standard will achieve an energy efficiency performance level that is generally equivalent to a rating of 80 or more when evaluated in accordance with NRCan, "EnerGuide for New Houses: Administrative and Technical Procedures", January 2005. It must be used in conjunction with Chapter 3 of this Supplementary Standard.

Chapter 3: Measures to Control Air Infiltration

This Chapter contains air infiltration requirements for exterior windows and air barrier provisions for wall, ceiling and floor assemblies of houses. This Chapter must be used in conjunction with Chapter 2 of this Supplementary Standard.

Section 3.1. sets the maximum air leakage rates for exterior windows while Section 3.2. contains provisions for air barrier systems of houses. Both Sections must be used with one of the prescriptive compliance packages in Subsection 2.1.1. or the performance compliance method in Subsection 2.1.2. of this Supplementary Standard in order to achieve an energy efficiency performance level that is generally equivalent to a rating of 80 or more when evaluated in accordance with NRCan, "EnerGuide for New Houses: Administrative and Technical Procedures", January 2005.

The requirements of Chapter 3 will remain in effect until January 1, 2012, at which time identical provisions will become effective in the Building Code pursuant to Ontario Regulation 503/09. Current Building Code requirements in Article 9.7.1.7. and Subsection 9.25.3. related to enhanced provisions in Sections 3.1. and 3.2. of this Supplementary Standard remain in effect until December 31, 2011. On January 1, 2012, Article 9.7.1.7. and Subsection 9.25.3. of the Building Code are revoked and substituted with corresponding provisions pursuant to Ontario Regulation 503/09.

Chapter 1

General

Section 1.1. Scope

1.1.1. Energy Efficiency Compliance

1.1.1.2. Chapters 2 and 3

(1) Compliance with Chapters 2 and 3 of this Standard shall be deemed to meet the energy efficiency requirements in accordance with Sentences 12.2.1.1.(3) and 12.2.1.2.(3) of Division B in the Building Code.

Section 1.2. Application

1.2.1. Application of Supplementary Standard SB-12

1.2.1.1. Energy Efficiency Design

(1) The energy efficiency of a *building* or part of a *building* of *residential occupancy* that is within the scope of Part 9 and is intended for *occupancy* on a continuing basis during the winter months shall comply with this Supplementary Standard in accordance with Sentences 12.2.1.1.(3) and 12.2.1.2.(3) of Division B in the Building Code.

Section 1.3. Terms and Abbreviations

1.3.1. Definitions of Words and Phrases

1.3.1.1. Non-defined Terms

(1) Definitions of words and phrases used in this Supplementary Standards that are not included in the list of definitions in Articles 1.4.1.2. and 1.4.1.3. of Division A in the Building Code and are not defined in another provision of the Code shall have the meanings that are commonly assigned to them in the context in which they are used, taking into account the specialized use of terms by the various trades and professions to which the terminology applies.

1.3.1.2. Defined Terms

(1) Each of the words and terms in italics in this Supplementary Standard has the same meaning as in subsection 1(1) of the *Building Code Act, 1992* or Clause 1.4.1.2.(1)(b) of Division A in the Building Code.

1.3.2. Symbols and Other Abbreviations

1.3.2.1. Symbols and Other Abbreviations

- (1) Where used in this Supplementary Standard, a symbol or abbreviation listed in Column 2 of Table 1.4.2.1. of Division B in the Building Code shall have the meaning listed opposite it in Column 3.
- (2) The abbreviations listed in Column 2 of Table 1.3.2.1. shall also apply to this Supplementary Standard and shall have the meaning listed opposite it in Column 3.

Table 1.3.2.1.
Abbreviations
Forming Part of Sentence 1.3.2.1.(2)

Item	Abbreviation	Meaning
1	AFUE	annual fuel utilization efficiency
2	EF	energy factor
3	HRV	heat recovery ventilator
4	ICF	insulating concrete form
Column 1	2	3

Section 1.4. Referenced Documents and Organizations

1.4.1. Referenced Documents

1.4.1.1. Effective Date

(1) Except as provided in Sentence (2), and unless otherwise specified in this Supplementary Standard, the documents referenced in this Supplementary Standard shall include all amendments, revisions and supplements effective to November 30, 2009.

(2) All references to NRCan, "EnerGuide for New Houses: Administrative and Technical Procedures" shall be the 2005 edition with all amendments, revisions and supplements effective to May 31, 2006.

1.4.1.2. Applicable Editions

(1) Where documents are referenced in this Supplementary Standard, they shall be the editions designated in Column 2 of Table 1.3.1.2. in Division B of the Building Code.

1.4.2. Abbreviations

1.4.2.1. Abbreviations of Proper Names

(1) Where used in this Supplementary Standard, abbreviations of proper names listed in Column 1 of Table 1.3.2.1. in Division B of the Building Code shall have the meaning assigned opposite it in Column 2.

Chapter 2

Acceptable Solutions for Energy Efficiency Compliance

Section 2.1. Methods for Achieving Energy Efficiency Compliance

2.1.1. Prescriptive Compliance Packages (See Appendix A.)

2.1.1.1. Energy Efficiency

(1) Except as permitted in Articles 2.1.1.5., 2.1.1.6., 2.1.1.8., 2.1.1.9. and 2.1.1.10., the minimum thermal performance and energy efficiency of *building* envelope and space heating equipment, domestic hot water heating equipment and heat recovery ventilators equipment shall conform to

- (a) Article 2.1.1.2. if the *building* is located in Zone 1 with less than 5000 heating degree days, or
- (b) Article 2.1.1.3. if the *building* is located in Zone 2 with 5000 or more heating degree days.

(2) All walls, ceilings, floors, windows and doors that separate heated space from unheated space, the exterior air or the exterior *soil* shall have thermal resistance ratings conforming to this Subsection.

(3) Where specified in compliance packages in Tables 2.1.1.2.A, 2.1.1.2.B and 2.1.1.2.C and Tables 2.1.1.3.A, 2.1.1.3.B and 2.1.1.3.C, space heating equipment, domestic hot water heating equipment and heat recovery ventilators shall have the efficiency rating conforming to this Subsection.

(4) Insulation shall be provided between heated and unheated spaces and between heated spaces and the exterior in accordance with this Chapter.

(5) Reflective surfaces of insulating materials shall not be considered in calculating the thermal resistance of *building* assemblies.

(6) Where glass block is used in a wall, the required minimum overall performance of the *building* envelope shall be maintained by increasing thermal performance of other components sufficient to compensate for the additional heat loss through the glass block.

(7) Except as provided in Sentence (8) and except as permitted in Sentence (9), where the ratio of the gross area of windows, sidelights, skylights, glazing in doors and sliding glass doors to the gross area of peripheral walls measured from grade to the top of the upper most ceiling is not more than 17%, the *building* shall comply with a compliance package selected from Tables 2.1.1.2.A, 2.1.1.2.B and 2.1.1.2.C and Tables 2.1.1.3.A, 2.1.1.3.B and 2.1.1.3.C.

- (8) Except as permitted in Sentences (9) and 2.1.1.10.(4), where the ratio of the gross area of windows, sidelights, skylights, glazing in doors and sliding glass doors to the gross area of peripheral walls measured from grade to the top of the upper most ceiling is more than 17% but not more than 22%, the *building* shall comply with a compliance package selected from Tables 2.1.1.2.A, 2.1.1.2.B and 2.1.1.2.C and Tables 2.1.1.3.A, 2.1.1.3.B and 2.1.1.3.C, and the overall coefficient of heat transfer of the glazing shall be upgraded to
- 1.8 where the selected compliance package requires 2.0,
 - 1.6 where the selected compliance package requires 1.8, and
 - 1.4 where the selected compliance package requires 1.6.
- (9) Glazing in main entrance doors and adjacent sidelights to main entrance doors need not be calculated for the purposes of Sentences (7) and (8).
- (10) Except as provided in Sentence (9), where the ratio of gross area of windows, sidelights, skylights, glazing in doors and sliding glass doors to the gross area of exterior walls measured from grade to the top of the upper most ceiling is more than 22%, the *building* shall comply with Subsection 2.1.2.
- (11) Where a *dwelling unit* has a walkout *basement*, *basement* walls separating indoor spaces from outdoor spaces shall have a thermal performance level equal to that of the above grade walls.
- (12) The minimum thermal resistance of insulation shall conform to the applicable values specified in Articles 2.1.1.2. and 2.1.1.3.
- (13) The minimum annual fuel utilization efficiency of a furnace serving a *building of residential occupancy* shall conform to Table 2.1.1.1.A.
- (14) Where space heating is supplied by a solid fuel-burning *appliance* or an earth energy system, the compliance package is permitted to comply with Tables 2.1.1.2.A. and 2.1.1.3.A.

Table 2.1.1.1.A.
Furnace Minimum Annual Fuel Utilization Efficiency
 Forming Part of Sentence 2.1.1.1.(13)

Furnace Fuel Source	Minimum AFUE
Natural gas	90%
Propane	90%
Oil	(1)
Column 1	2

Note to Table 2.1.1.1.A.:

(1) Minimum efficiency regulated by *Green Energy Act, 2009*.

2.1.1.2. Energy Efficiency for Zone 1 Buildings

- (1) Except as required in Sentences (2) to (4), the minimum thermal performance of *building* envelope and equipment shall conform to Table 2.1.1.2.A.

Table 2.1.1.2.A
ZONE 1 - Compliance Packages for Space Heating Equipment with AFUE \geq 90%
 Forming Part of Sentence 2.1.1.2.(1)

Component	Compliance Package												
	A	B	C	D	E	F	G	H	I	J	K ⁽⁴⁾	L ⁽⁵⁾	M ⁽⁶⁾
Ceiling with Attic Space Minimum RSI (R)-Value ⁽¹⁾	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)
Ceiling Without Attic Space Minimum RSI (R)-Value ⁽¹⁾	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)
Exposed Floor Minimum RSI (R)-Value ⁽¹⁾	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)
Walls Above Grade Minimum RSI (R)-Value ⁽¹⁾	4.23 (R24)	4.75 (R27)	4.75 (R27)	4.23 (R24)	4.23 (R24)	4.23 (R24)	4.23 (R24)	4.23 (R24)	3.87 (R22)	3.87 (R22)	3.87 (R22)	4.23 (R24)	4.23 (R24)
Basement Walls Minimum RSI (R)-Value ⁽¹⁾	3.52 (R20)	3.52 (R20)	3.52 (R20)	3.52 (R20)	3.52 (R20)	2.11 (R12)	2.11 (R12)	2.11 (R12)	3.52 (R20)	2.11 (R12)	3.87 (R22)	3.87 (R22)	3.52 (R20)
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	0.88 (R5)	-	-	-	-	-	-	-	-	-	-	-	-
Edge of Below Grade Slab \leq 600 mm Below Grade Minimum RSI (R)-Value ⁽¹⁾	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)
Heated Slab or Slab \leq 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)
Windows and Sliding Glass Doors Maximum U-Value ⁽²⁾	1.6	1.6	1.8	1.8	1.8	1.8	1.8	2	1.8	1.8	1.8	1.8	1.8
Skylights Maximum U-Value ⁽²⁾	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Space Heating Equipment Minimum AFUE	90%	90%	94%	94%	90%	94%	92%	94%	92%	94%	90%	94%	90%
HRV Minimum Efficiency	-	-	-	-	55%	60%	60%	70%	55%	60%	-	-	-
Domestic Hot Water Heater Minimum EF	0.57 ⁽³⁾	0.57 ⁽³⁾	0.62	0.67	0.57 ⁽³⁾	0.57 ⁽³⁾	0.62	0.67	0.62	0.67	0.57 ⁽³⁾	0.57 ⁽³⁾	0.80
Column 1	2	3	4	5	6	7	8	9	10	11	12	13	14

Notes to Table 2.1.1.2.A:

- (1) The values listed are minimum RSI-Values for the thermal insulation component only. RSI-Values expressed in (m²·K)/W.
- (2) U-Value is the overall coefficient of heat transfer expressed in W/(m²·K).
- (3) Minimum efficiency regulated by *Green Energy Act, 2009*.
- (4) Applies to a *building* with both ICF *basement* walls and ICF above grade walls where the thermal insulation value is the sum of the insulation value on both sides of the walls.
- (5) Applies to a *building* with ICF *basement* walls only where the thermal insulation value is the sum of the insulation value on both sides of the walls.
- (6) Applies to a *building* with combined space heating and domestic hot water heating system.

(2) Except for solid fuel-burning space-heating equipment and natural gas and propane furnaces, where the space

heating equipment efficiency ranges from 78% to less than 90%, the minimum thermal performance of the *building* envelope and equipment shall conform to Table 2.1.1.2.B.

Table 2.1.1.2.B
ZONE 1 - Compliance Packages for Space Heating Equipment with AFUE \geq 78 % and < 90%
 Forming Part of Sentence 2.1.1.2.(2)

Component	Compliance Package					
	A	B	C	D	E	F
Ceiling with Attic Space Minimum RSI (R)-Value ⁽¹⁾	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)
Ceiling Without Attic Space Minimum RSI (R)-Value ⁽¹⁾	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)
Exposed Floor Minimum RSI (R)-Value ⁽¹⁾	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)
Walls Above Grade Minimum RSI (R)-Value ⁽¹⁾	5.11 (R29)	5.11 (R29)	5.11 (R29)	4.75 (R27)	4.75 (R27)	4.75 (R27)
Basement Walls Minimum RSI (R)-Value ⁽¹⁾	3.52 (R20)	2.11 (R12)	3.52 (R20)	3.52 (R20)	3.52 (R20)	3.52 (R20)
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	-	-	-	-	-	-
Edge of Below Grade Slab \leq 600 mm Below Grade Minimum RSI (R)-Value ⁽¹⁾	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)
Heated Slab or Slab \leq 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)
Windows and Sliding Glass Doors Maximum U-Value ⁽²⁾	1.6	1.6	1.8	1.6	1.6	1.8
Skylights Maximum U-Value ⁽²⁾	2.8	2.8	2.8	2.8	2.8	2.8
Space Heating Equipment Minimum AFUE	78%	84%	84%	84%	78%	84%
HRV Minimum Efficiency	55%	55%	70%	55%	70%	75%
Domestic Hot Water Heater Minimum EF ⁽³⁾	-	-	-	-	-	-
Column 1	2	3	4	5	6	7

Notes to Table 2.1.1.2.B.:

- (1) The values listed are minimum RSI-Values for the thermal insulation component only. RSI-Values expressed in (m²·K)/W.
 (2) U-Value is the overall coefficient of heat transfer expressed in W/(m²·K).
 (3) Minimum efficiency regulated by *Green Energy Act, 2009*.

(3) Where *electric space heating* is used, the minimum thermal performance of the *building* envelope and equipment shall conform to Table 2.1.1.2.C.

Table 2.1.1.2.C
ZONE 1 - Compliance Packages for Electric Space Heating
 Forming Part of Sentence 2.1.1.2.(3)

Component	Compliance Package	
	A	B
Ceiling with Attic Space Minimum RSI (R)-Value ⁽¹⁾	8.81 (R50)	8.81 (R50)
Ceiling Without Attic Space Minimum RSI (R)-Value ⁽¹⁾	5.46 (R31)	5.46 (R31)
Exposed Floor Minimum RSI (R)-Value ⁽¹⁾	5.46 (R31)	5.46 (R31)
Walls Above Grade Minimum RSI (R)-Value ⁽¹⁾	5.11 (R29)	5.11 (R29)
Basement Walls Minimum RSI (R)-Value ⁽¹⁾	3.52 (R20)	2.11 (R12)
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	-	-
Edge of Below Grade Slab ≤ 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	1.76 (R10)	1.76 (R10)
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	1.76 (R10)	1.76 (R10)
Windows and Sliding Glass Doors Maximum U-Value ⁽²⁾	1.6	1.6
Skylights Maximum U-Value ⁽²⁾	2.8	2.8
Space Heating Equipment Minimum AFUE	-	-
HRV Minimum Efficiency	55%	75%
Domestic Hot Water Heater Minimum EF	-	-
Column 1	2	3

Notes to Table 2.1.1.2.C:

- (1) The values listed are minimum RSI-Values for the thermal insulation component only. RSI-Values expressed in (m²·K)/W.
 (2) U-Value is the overall coefficient of heat transfer expressed in W/(m²·K).

(4) Except for solid fuel-burning space heating equipment, where the space heating equipment efficiency is less than 78% or it cannot meet the requirements of the applicable compliance packages, energy efficiency compliance shall be achieved in accordance with Clause 1 2.2.1.2.(3)(a) of Division B in the Building Code or Subsection 2.1.2. of this Supplementary Standard.

2.1.1.3. Energy Efficiency for Zone 2 Buildings

(1) Except as required in Sentences (2) to (4), the minimum thermal performance of the *building* envelope and equipment shall conform to Table 2.1.1.3.A.

Table 2.1.1.3.A
ZONE 2 - Compliance Packages for Space Heating Equipment with AFUE ≥ 90%
 Forming Part of Sentence 2.1.1.3.(1)

Component	Compliance Package												
	A	B	C	D	E	F	G	H	I	J	K ⁽⁴⁾	L ⁽⁵⁾	M ⁽⁶⁾
Ceiling with Attic Space Minimum RSI (R)-Value ⁽¹⁾	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)	8.81 (R50)
Ceiling Without Attic Space Minimum RSI (R)-Value ⁽¹⁾	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)
Exposed Floor Minimum RSI (R)-Value ⁽¹⁾	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)
Walls Above Grade Minimum RSI (R)-Value ⁽¹⁾	5.11 (R29)	5.11 (R29)	5.11 (R29)	4.75 (R27)	4.75 (R27)	4.75 (R27)	4.75 (R27)	4.23 (R24)	4.23 (R24)	4.23 (R24)	3.87 (R22)	4.23 (R24)	4.23 (R24)
Basement Walls Minimum RSI (R)-Value ⁽¹⁾	3.52 (R20)	3.52 (R20)	3.52 (R20)	3.52 (R20)	3.52 (R20)	3.52 (R20)	2.11 (R12)	3.52 (R20)	3.52 (R20)	2.11 (R12)	3.87 (R22)	3.87 (R22)	3.52 (R20)
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	0.88 (R5)	-	-	0.88 (R5)	-	-	-	0.88 (R5)	-	-	-	-	-
Edge of Below Grade Slab ≤ 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)	1.76 (R10)
Windows and Sliding Glass Doors Maximum U-Value ⁽²⁾	1.6	1.6	1.8	1.6	1.6	1.8	1.8	1.6	1.6	1.6	1.8	1.8	1.8
Skylights Maximum U-Value ⁽²⁾	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Space-Heating Equipment Minimum AFUE	90%	94%	92%	94%	94%	94%	94%	94%	94%	90%	94%	94%	90%
HRV Minimum Efficiency	-	-	60%	-	-	60%	75%	-	60%	60%	-	-	55%
Domestic Hot Water Heater Minimum EF	0.57 ⁽³⁾	0.57 ⁽³⁾	0.57 ⁽³⁾	0.57 ⁽³⁾	0.67	0.57 ⁽³⁾	0.62	0.67	0.57 ⁽³⁾	0.67	0.57 ⁽³⁾	0.67	0.80
Column 1	2	3	4	5	6	7	8	9	10	11	12	13	14

Notes to Table 2.1.1.3.A.:

- (1) The values listed are minimum RSI-Values for the thermal insulation component only. RSI-Values expressed in (m²· K)/W.
- (2) U-Value is the overall coefficient of heat transfer expressed in W/(m²· K).
- (3) Minimum efficiency regulated by *Green Energy Act, 2009*.
- (4) Applies to a *building* with both ICF basement walls and ICF above grade walls where the thermal insulation value is the sum of the insulation value on both sides of the walls.
- (5) Applies to a *building* with ICF basement walls only where the thermal insulation value is the sum of the insulation value on both sides of the walls.
- (6) Applies to a *building* with combined space heating and domestic hot water heating system.

(2) Except for solid fuel-burning space heating equipment and natural gas and propane furnaces, where the space heating equipment efficiency ranges from 78 % to less than 90 %, the minimum thermal performance of *building envelope* and equipment shall conform to Table 2.1.1.3.B.

Table 2.1.1.3.B
ZONE 2 - Compliance Packages for Space Heating Equipment with AFUE \geq 78 % and $<$ 90%
 Forming Part of Sentence 2.1.1.3.(2)

Component	Compliance Package	
	A	B
Ceiling with Attic Space Minimum RSI (R)-Value ⁽¹⁾	8.81 (R50)	8.81 (R50)
Ceiling Without Attic Space Minimum RSI (R)-Value ⁽¹⁾	5.46 (R31)	5.46 (R31)
Exposed Floor Minimum RSI (R)-Value ⁽¹⁾	5.46 (R31)	5.46 (R31)
Walls Above Grade Minimum RSI (R)-Value ⁽¹⁾	5.11 (R29)	5.11 (R29)
Basement Walls Minimum RSI (R)-Value ⁽¹⁾	3.52 (R20)	3.52 (R20)
Below Grade Slab Entire surface $>$ 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	0.88 (R5)	0.88 (R5)
Edge of Below Grade Slab \leq 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	1.76 (R10)	1.76 (R10)
Heated Slab or Slab \leq 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	1.76 (R10)	1.76 (R10)
Windows and Sliding Glass Doors Maximum U-Value ⁽²⁾	1.6	1.6
Skylights Maximum U-Value ⁽²⁾	2.8	2.8
Space Heating Equipment Minimum AFUE	78%	84%
HRV Minimum Efficiency	75%	60%
Domestic Hot Water Heater Minimum EF ⁽³⁾	-	-
Column 1	2	3

Notes to Table 2.1.1.3.B.:

- (1) The values listed are minimum RSI-Values for the thermal insulation component only. RSI -Values expressed in (m² K)/W.
- (2) U-Value is the overall coefficient of heat transfer expressed in W/(m² K).
- (3) Minimum efficiency regulated by *Green Energy Act, 2009*.

(3) Where *electric space heating* is used, the minimum thermal performance of the *building* envelope and equipment shall conform to Table 2.1.1.3.C.

Table 2.1.1.3.C
ZONE 2 - Compliance Packages for Electric Space Heating
 Forming Part of Sentence 2.1.1.3.(3)

Component	Compliance Package A
Ceiling with Attic Space Minimum RSI (R)-Value ⁽¹⁾	8.81 (R50)
Ceiling Without Attic Space Minimum RSI (R)-Value ⁽¹⁾	5.46 (R31)
Exposed Floor Minimum RSI (R)-Value ⁽¹⁾	5.46 (R31)
Walls Above Grade Minimum RSI (R)-Value ⁽¹⁾	5.11 (R29)
Basement Walls Minimum RSI (R)-Value ⁽¹⁾	3.52 (R20)
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	0.88 (R5)
Edge of Below Grade Slab ≤ 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	1.76 (R10)
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value ⁽¹⁾	1.76 (R10)
Windows and Sliding Glass Doors Maximum U-Value ⁽²⁾	1.6
Skylights Maximum U-Value ⁽²⁾	2.8
Space Heating Equipment Minimum AFUE	-
HRV Minimum Efficiency	75%
Domestic Hot Water Heater Minimum EF	-
Column 1	2

Notes to Table 2.1.1.3.C.:

- (1) The values listed are minimum RSI-Values for the thermal insulation component only. RSI-Values expressed in (m² K)/W.
 (2) U-Value is the overall coefficient of heat transfer expressed in W/(m² K).

(4) Except for solid fuel-burning space heating equipment, where the space heating equipment efficiency is less than 78% or it cannot meet the requirements of the applicable compliance packages, energy efficiency compliance shall be achieved in accordance with Clause 1 2.2.1.2.(3)(a) of Division B in the Building Code or Subsection 2.1.2. of this Supplementary Standard.

2.1.1.4. Elements Acting as a Thermal Bridge

- (1) Except for a *foundation* wall, the insulated portion of a wall that incorporates wood stud framing elements that have a thermal resistance of less than RSI 0.90 shall be insulated to restrict heat flow through the studs by a material providing a thermal resistance at least equal to 25% of the thermal resistance required for the insulated portion of the assembly in Articles 2.1.1.2. and 2.1.1.3.
- (2) Except as provided in Sentence (3), the thermal resistance of the insulated portion of a *building* assembly in Articles 2.1.1.2. and 2.1.1.3. that incorporates metal framing elements, such as steel studs and steel joists, that act as thermal bridges to facilitate heat flow through the assembly, shall be 20% greater than the values shown in Tables 2.1.1.2.A, 2.1.1.2.B and 2.1.1.2.C and Tables 2.1.1.3.A, 2.1.1.3.B and 2.1.1.3.C, unless it can be shown that the heat flow is not greater than the heat flow through a wood frame assembly of the same thickness.
- (3) Sentence (2) does not apply to *building* assemblies incorporating thermal bridges where the thermal bridges are insulated to restrict heat flow through the thermal bridges by a material providing a thermal resistance at least equal to 25% of the thermal resistance required for the insulated portion of the assembly in Articles 2.1.1.2. and 2.1.1.3.

2.1.1.5. Log Wall Construction and Post, Beam and Plank Construction

- (1) Except as provided in Sentences (2) and (3), log wall construction and post, beam and plank construction shall have a minimum thermal resistance of RSI 2.1 for the total assembly.
- (2) The thermal resistance value in Sentence (1) for the total wall assembly may be reduced to not less than RSI 1.61 if,
 - (a) the thermal resistance of insulation for the exposed roof or ceiling required in Table 2.1.1.2.A. is increased by an amount equivalent to the reduction permitted in this Sentence, and
 - (b) for log walls, the logs have tongue-and-groove or splined joints.
- (3) Where milled log walls are installed, the thermal resistance value in Sentence (1) for the total wall assembly does not apply if,
 - (a) the mean thickness of each log is not less than 150 mm,
 - (b) the thermal resistance of insulation for the exposed roof or ceiling required in Table 2.1.1.2.A is increased by RSI 0.53, and
 - (c) the logs have tongue-and-groove or splined joints.

2.1.1.6. Insulation of Foundation Walls

- (1) *Foundation* walls enclosing heated space shall be insulated from the underside of the subfloor to not more than 200 mm above the finished floor level of the *basement*.
- (2) The insulation required by Sentence (1) may be provided by a system installed,
 - (a) on the interior of the *foundation* wall,
 - (b) on the exterior face of the *foundation* wall, or
 - (c) partially on the interior and partially on the exterior, provided the thermal performance of the system is equivalent to that permitted in Clauses (a) or (b).
- (3) If a *foundation* wall is constructed of hollow masonry units, one or more of the following shall be used to control convection currents in the core spaces,
 - (a) filling the core spaces,
 - (b) at least one row of semi-solid blocks at or below *grade*, or
 - (c) other similar methods.

- (4) Masonry walls of hollow units that penetrate the ceiling shall be sealed at or near the ceiling adjacent to the roof space to prevent air within the voids from entering the *attic or roof space* by,
- capping with masonry units without voids, or
 - installation of flashing material extending across the full width of the masonry.
- (5) Except as provided in Sentences (6) and (7), where the *basement* slab edge is the only part of the slab that is at the exterior ground level such as a walk-out *basement*, or within 600 mm to the exterior ground level, the insulation around concrete slab shall extend not less than 600 mm below exterior ground level.
- (6) Where the concrete slab is within 600 mm of the exterior ground level, the entire surface of the slab shall be insulated.
- (7) Where a slab contains heating ducts, pipes, tubes or cables, the entire heated surface of the slab that is in contact with the ground shall be insulated.

2.1.1.7. Enclosed Unheated Space

- (1) Where an enclosed unheated space is separated from a heated space by glazing, the unheated enclosure may be considered to provide a thermal resistance of RSI 0.16.

2.1.1.8. Thermal Performance of Windows, Skylights and Sliding Glass Doors

- (1) Windows, skylights and sliding glass doors shall meet
- the required overall coefficient of heat transfer in Tables 2.1.1.2.A, 2.1.1.2.B and 2.1.1.2.C and Tables 2.1.1.3.A, 2.1.1.3.B and 2.1.1.3.C, or
 - the corresponding energy rating in Table 2.1.1.8.

Table 2.1.1.8.
Energy Ratings (ER) for Windows, Skylights and Sliding Glass Doors
Forming Part of Sentence 2.1.1.8.(1)

	Maximum U-Values		Minimum Energy Rating (ER) Values	
	U-Value (W/m ² ·K)	U-Value (Btu/h·ft. ² ·°F)	Operable	Fixed
Skylights	2.8	0.5	-	-
Windows and Sliding Glass Door Types	2	0.35	17	27
	1.8	0.32	21	31
	1.6	0.28	25	35
	1.4	0.25	29	39
Column 1	2	3	4	5

- (2) The energy rating and the overall coefficient of heat transfer required for windows and sliding glass doors in a *residential occupancy* shall be determined in conformance with CAN/CSA-A440.2, "Energy Performance Evaluation of Windows and Sliding Glass Doors".
- (3) A *basement* window that incorporates a *loadbearing* structural frame shall be double glazed with a low-E coating.

2.1.1.9. Minimum Thermal Resistance of Doors

(1) Except for doors on enclosed unheated vestibules and cold cellars, and except for glazed portions of doors, all doors that separate heated space from unheated space shall have a thermal resistance of not less than RSI 0.7 where a storm door is not provided.

2.1.1.10. Additions to Existing Buildings

(1) Except as permitted in Sentences (2) and (3), an addition to an *existing building* shall comply with one of the permitted compliance packages in this Chapter selected on the basis of

- (a) Zone location and energy source, and
- (b) thermal insulation having a thermal resistance of not less than
 - (i) RSI 4.23 (R24) for walls above grade, and
 - (ii) RSI 3.52 (R20) for *basement* walls.

(2) Except as provided in Sentence (3), the design and construction of an addition need not meet the requirements of a permitted compliance package described in Sentence (1) for

- (a) an HRV, and
- (b) efficiency requirements for existing domestic hot water heaters and space heating equipment.

(3) A compliance package that does not meet the requirements of Clause (1)(b) is permitted to be used provided that the requirements for all components of the compliance package are met.

(4) A sunroom with a gross glass area to gross peripheral wall ratio greater than 22% as described in Sentence 2.1.1.1.(10) is not required to comply with Subsection 2.1.2. but shall comply with a permitted compliance package and the overall coefficient heat transfer of the glazing shall be upgraded in accordance with Sentence 2.1.1.1.(8).

2.1.2. Performance Compliance

2.1.2.1. Required Performance Level

(1) The performance level shall be measured based on the annual energy use of the *building*.

(2) The *building* shall meet the performance level of a permitted compliance package in this Chapter selected on the basis of

- (a) Zone location,
- (b) energy source, and
- (c) equipment efficiency.

(3) Where compliance is achieved in accordance with Sentence (2), the annual energy use calculations shall be

- (a) as proposed, and
- (b) in compliance with the permitted compliance package.

(4) For the purpose of calculations required in Sentence (3),

- (a) a recognized annual energy simulation software shall be used to calculate annual energy use,
- (b) local climatic data shall be used,
- (c) the air leakage rate of a *dwelling unit* may be assumed to be
 - (i) 3.1 air changes per hour at an air pressure differential of 50 Pa for detached homes, and
 - (ii) 3.6 air changes per hour at an air pressure differential of 50 Pa for attached homes, and
- (d) the equivalent domestic hot water, appliance and other plug-in loads shall be assumed in both calculations. (See Appendix A.)

(5) Where the overall thermal performance of the proposed *building* envelope is less than the envelope performance of the compliance package that is compared against it, the reduction in the performance level of the *building* envelope shall not be more than 25%.

(6) The requirements of Chapter 3 shall apply to this Subsection.

Chapter 3

Measures to Control Air Infiltration

3.1. Air Infiltration of Exterior Windows

3.1.1. Air Leakage Rate of Exterior Windows

- (1) The air leakage rate of windows shall not exceed 1.65 m³/h per metre (0.29 cfm per foot) of crack length when evaluated in accordance with the CAN/CSA-A440.1, "User Selection Guide to CSA Standard CAN/CSA-A440-00 Windows".

3.2. Air Barrier Systems

3.2.1. Required Barrier to Air Leakage

- (1) Wall, ceiling and floor assemblies that separate *conditioned spaces* from unconditioned spaces shall be constructed so as to include an *air barrier system* that will provide a continuous barrier to air leakage,
 - (a) from the interior of the *building* into wall, floor, *attic or roof spaces* sufficient to prevent excessive moisture condensation in such spaces during the heating season, and
 - (b) from the exterior inward sufficient to prevent moisture condensation on the room side during the heating season.
- (2) The continuity of the *air barrier system* shall extend throughout the *basement*.

3.2.2. Air Barrier System Properties

- (1) Sheet and panel type materials intended to provide the principal resistance to air leakage shall have an air leakage characteristic not greater than 0.02 L/(s·m²) measured at an air pressure differential of 75 Pa.
- (2) Where polyethylene sheet is used to provide the air-tightness in the *air barrier system*, it shall conform to CAN/CGSB-51.34-M, "Vapour Barrier, Polyethylene Sheet for Use in Building Construction".

3.2.3. Continuity of the Air Barrier System

- (1) Where the *air barrier system* consists of an air-impermeable panel-type material, all joints shall be sealed to prevent air leakage.
- (2) Where the *air barrier system* consists of flexible sheet material, all joints shall be,
 - (a) sealed with compatible material such as tape or flexible sealant, or
 - (b) except as required in Sentence (3), lapped not less than 100 mm and clamped, such as between framing members, furring or blocking and rigid panels.
- (3) Where an *air barrier system* consisting of flexible sheet material is installed at locations where it is not supported by an interior finish, such as behind a bath tub, shower enclosure, or fireplace, the continuity of the air barrier shall be

maintained by sealing its joints.

- (4) Where an interior wall meets an exterior wall, ceiling, floor or roof required to be provided with an air barrier protection, the *air barrier system* shall extend across the intersection and shall be sealed in accordance with Sentences (1) and (2).
- (5) Where an interior wall projects through a ceiling or extends to become an exterior wall, spaces in the wall shall be blocked to provide continuity across those spaces with the *air barrier system* in the abutting walls or ceiling by,
 - (a) sealing each air barrier to the blocking, or
 - (b) wrapping each air barrier around the transition and sealing in accordance with Sentences (1) and (2).
- (6) Where an interior floor projects through an exterior wall or extends to become an exterior floor, continuity of the *air barrier system* shall be maintained from the abutting walls across the floor assembly.
- (7) Where an interior floor projects through an exterior wall to become an exterior floor,
 - (a) the air barrier of the wall under the floor shall be continuous with or sealed to the subfloor or the air barrier on the underside of the floor,
 - (b) the air barrier of the wall above the floor shall be continuous with or sealed to the subfloor or the air barrier on the top of the floor, and
 - (c) the spaces between floor joists shall be blocked and sealed.
- (8) Where a header wrap is used as an air barrier, it shall be sealed or lapped to the wall air barrier above and below in accordance with Sentences (1) and (2).
- (9) Penetrations of the *air barrier system*, such as those created by the installation of electrical wiring, electrical boxes, piping or ductwork, shall be sealed with compatible material such as tape or caulking to maintain the integrity of the *air barrier system* over the entire surface.
- (10) Penetrations of the *air barrier system*, such as those created by the installation of doors, windows and other fenestration shall be sealed to maintain the integrity of the *air barrier system* over the entire surface.
- (11) Where an interior air barrier is penetrated by doors, windows and other fenestration, the air barrier shall be sealed to the door frame or window frame with,
 - (a) compatible tape, or
 - (b) spray foam insulation.
- (12) Where an exterior air barrier is penetrated by doors, windows and other fenestration, the air barrier shall be sealed to the door frame or window frame with,
 - (a) compatible flexible flashing material,
 - (b) caulking, or
 - (c) spray foam insulation.
- (13) An access hatch installed through an assembly constructed with an *air barrier system* shall be weatherstripped around the perimeter to prevent air leakage.
- (14) Clearances between *chimneys* or *gas vents* and the surrounding construction that would permit air leakage from within the building into a wall or *attic* or *roof space* shall be sealed by *noncombustible* material to prevent such leakage and shall be sealed to the air barrier with tape or another compatible material, and to the vent with high temperature caulking in accordance with the manufacturer's installation instructions.
- (15) Where the *foundation* wall and floor slab are used as an air barrier, they shall be caulked at all joints, intersections and penetrations.

(16) Sump pit covers shall be sealed.

3.2.4. Vapour Barriers Used as Air Barriers

- (1) A *vapour barrier* used as an air barrier shall comply with the requirements of this Subsection.

Appendix Notes

A-2.1.1. - Compliance Packages.

Individual components of compliance packages found in Tables 2.1.1.2.A, 2.1.1.2.B and 2.1.1.2.C and Tables 2.1.1.3.A, 2.1.1.3.B and 2.1.1.3.C are not permitted to be mixed with similar components of other compliance packages either found within the same Table or similar components of compliance packages found in other Tables.

A-2.1.2.1.(4) - Simulation Software.

Computer simulations shall be carried out using HOT2000 version 9.34c or newer versions, or equivalent.

- (5) Sentence (1) does not apply to,
 - (a) *farm buildings*, and
 - (b) *buildings* intended primarily for manufacturing or commercial or industrial processing.

12.2.1.2. Energy Efficiency Design After December 31, 2011

- (1) Sentences (2) to (5) apply to *construction* for which a permit has been applied for after December 31, 2011.
- r₁₀ (2) Except as provided in Sentences (3) and (5), the energy efficiency of all *buildings* shall conform to Supplementary Standard SB-10.
- r₄ (3) The energy efficiency of a *building* or part of a *building* of *residential occupancy* that is within the scope of Part 9 and is intended for *occupancy* on a continuing basis during the winter months shall,
 - (a) meet the performance level that is equal to a rating of 80 or more when evaluated in accordance with NRCan, "EnerGuide for New Houses: Administrative and Technical Procedures", or
 - (b) conform to Supplementary Standard SB-12.
- (4) Reserved.
- (5) Sentence (1) does not apply to,
 - (a) *farm buildings*, and
 - (b) *buildings* intended primarily for manufacturing or commercial or industrial processing.

12.2.2. Motion Sensors

12.2.2.1. Motion Sensors

- (1) Lighting installed to provide the minimum illumination levels required by this Code may be controlled by motion sensors except where the lighting,
 - (a) is installed in an *exit*,
 - (b) is installed in a corridor serving patients or residents in a Group B, Division 2 or Division 3 *occupancy*, or
 - (c) is required to conform to Sentence 3.2.7.1.(5).
- (2) Where motion sensors are used to control minimum lighting in a *public corridor* or corridor providing *access to exit* for the public, the motion sensors shall be installed with switch controllers equipped for fail-safe operation and illumination timers set for a minimum 15-minute duration.
- (3) A motion sensor shall not be used to control emergency lighting.

Section 12.3. Energy Efficiency for Buildings Within the Scope of Part 9

12.3.1. General

12.3.1.1. Application

- (1) Except as provided in Sentence (2), this Section applies to the energy efficiency of *buildings* within the scope of Part 9 intended for *occupancy* on a continuing basis during the winter months.

r7 **9.25.3. Air Barrier Systems**

9.25.3.1. Required Barrier to Air Leakage (See Appendix A.)

- (1) Wall, ceiling and floor assemblies that separate *conditioned spaces* from unconditioned spaces shall be constructed so as to include an *air barrier system* that will provide a continuous barrier to air leakage,
 - (a) from the interior of the *building* into wall, floor, *attic or roof spaces* sufficient to prevent excessive moisture condensation in such spaces during the heating season, and
 - (b) from the exterior inward sufficient to prevent moisture condensation on the room side during the heating season.
- (2) The continuity of the *air barrier system* shall extend throughout the *basement*.

9.25.3.2. Air Barrier System Properties (See Appendix A.)

- (1) Sheet and panel type materials intended to provide the principal resistance to air leakage shall have an air leakage characteristic not greater than 0.02 L/(s·m²) measured at an air pressure differential of 75 Pa.
- (2) Where polyethylene sheet is used to provide the air-tightness in the *air barrier system*, it shall conform to CAN/CGSB-51.34-M, "Vapour Barrier, Polyethylene Sheet for Use in Building Construction".

9.25.3.3. Continuity of the Air Barrier System

- (1) Where the *air barrier system* consists of an air-impermeable panel-type material, all joints shall be sealed to prevent air leakage.
- (2) Where the *air barrier system* consists of flexible sheet material, all joints shall be,
 - (a) sealed with compatible material such as tape or flexible sealant, or
 - (b) except as required by Sentence (3), lapped not less than 100 mm and clamped, such as between framing members, furring or blocking and rigid panels.
- (3) Where an *air barrier system* consisting of flexible sheet material is installed at locations where it is not supported by an interior finish, such as a behind a bath tub, shower enclosure or fireplace, the continuity of the air barrier shall be maintained by sealing its joints.
- (4) Where an interior wall meets an exterior wall, ceiling, floor or roof required to be provided with an air barrier protection, the *air barrier system* shall extend across the intersection and shall be sealed in accordance with Sentences (1) and (2).
- (5) Where an interior wall projects through a ceiling or extends to become an exterior wall, spaces in the wall shall be blocked to provide continuity across those spaces with the *air barrier system* in the abutting walls or ceiling by,
 - (a) sealing each air barrier to the blocking, or
 - (b) wrapping each air barrier around the transition and sealing in accordance with Sentences (1) and (2).
- (6) Where an interior floor projects through an exterior wall or extends to become an exterior floor, continuity of the *air barrier system* shall be maintained from the abutting walls across the floor assembly.
- (7) Where an interior floor projects through an exterior wall to become an exterior floor,
 - (a) the air barrier of the wall under the floor shall be continuous with or sealed to the subfloor or the air barrier on the underside of the floor,
 - (b) the air barrier of the wall above the floor shall be continuous with or sealed to the subfloor or the air barrier on the top of the floor, and
 - (c) the spaces between floor joists shall be blocked and sealed.

(8) Where a header wrap is used as an air barrier, it shall be sealed or lapped to the wall air barrier above and below in accordance with Sentences (1) and (2).

(9) Penetrations of the *air barrier system*, such as those created by the installation of electrical wiring, electrical boxes, piping or ductwork, shall be sealed with compatible material such as tape or caulking to maintain the integrity of the *air barrier system* over the entire surface.

(10) Penetrations of the *air barrier system*, such as those created by the installation of doors, windows and other fenestration shall be sealed to maintain the integrity of the *air barrier system* over the entire surface.

(11) Where an interior air barrier is penetrated by doors, windows and other fenestration, the air barrier shall be sealed to the door frame or window frame with,

- (a) compatible tape, or
- (b) spray foam insulation.

(12) Where an exterior air barrier is penetrated by doors, windows and other fenestration, the air barrier shall be sealed to the door frame or window frame with,

- (a) compatible flexible flashing material,
- (b) caulking, or
- (c) spray foam insulation.

(13) An access hatch installed through an assembly constructed with an *air barrier system* shall be weatherstripped around the perimeter to prevent air leakage.

(14) Clearances between *chimneys* or *gas vents* and the surrounding construction that would permit air leakage from within the *building* into a wall or *attic* or *roof space* shall be sealed by *noncombustible* material to prevent such leakage and shall be sealed to the air barrier with tape or another compatible material, and to the vent with high temperature caulking in accordance with the manufacturer's installation instructions.

(15) Where the *foundation* wall and floor slab are used as an air barrier, they shall be caulked at all joints, intersections and penetrations.

(16) Sump pit covers shall be sealed.

9.25.3.4. Vapour Barriers Used as Air Barriers

(1) A *vapour barrier* used as an air barrier shall comply with the requirements of this Subsection.

1.3.2.2. Documentation on Site

- (1) The person in charge of the *construction* of the *building* shall keep and maintain on the site of the *construction*
 - (a) at least one copy of drawings and specifications certified by the *chief building official* or a person designated by the *chief building official* to be a copy of those submitted with the application for the permit to *construct* the *building*, together with changes that are authorized by the *chief building official* or a person designated by the *chief building official*, and
 - (b) authorization or facsimiles of it received from the Building Materials Evaluation Commission, including specified terms and conditions.

r₇ **1.3.3. Occupancy of Buildings**

r₇ **1.3.3.1. Occupancy Permit - General**

(1) Except as permitted in Sentence 1.3.3.2.(1), a person may occupy or permit to be occupied any *building* or part of it that has not been fully completed at the date of occupation where the *chief building official* or a person designated by the *chief building official* has issued a permit authorizing occupation of the *building* or part of it prior to its completion in accordance with Sentence (2).

r₇ (1.1) Sentence (1) does not apply in respect of the occupancy of a *building* to which Article 1.3.3.4. applies.

(2) The *chief building official* or a person designated by the *chief building official* shall issue a permit authorizing occupation of a *building*, where

- (a) the structure of the *building* or part of it is completed to the roof,
- (b) the enclosing walls of the *building* or part of it are completed to the roof,
- (c) the walls enclosing the space to be occupied are completed, including balcony *guards*,
- (d) all required *fire separations* and *closures* are completed on all *storeys* to be occupied,
- (e) all required *exits* are completed and fire separated including all doors, door hardware, self-closing devices, balustrades and handrails from the uppermost floor to be occupied down to *grade* level and below if an *exit* connects with lower *storeys*,
- (f) all shafts including *closures* are completed to the floor-ceiling assembly above the *storey* to be occupied and have a temporary *fire separation* at such assembly,
- (g) measures have been taken to prevent access to parts of the *building* and site that are incomplete or still under *construction*,
- (h) floors, halls, lobbies and required *means of egress* are kept free of loose materials and other hazards,
- (i) if service rooms should be in operation, required *fire separations* are completed and all *closures* installed,
- (j) all *building drains*, *building sewers*, *water systems*, *drainage systems* and *venting systems* are complete and tested as operational for the *storeys* to be occupied,
- (k) required lighting, heating and electrical supply are provided for the *suites*, rooms and common areas to be occupied,
- (l) required lighting in corridors, stairways and *exits* is completed and operational up to and including all *storeys* to be occupied,
- (m) required standpipe, sprinkler and fire alarm systems are complete and operational up to and including all *storeys* to be occupied, together with required pumper connections for such standpipes and sprinklers,
- (n) required fire extinguishers have been installed on all *storeys* to be occupied,
- (o) main garbage rooms, chutes and ancillary services thereto are completed to *storeys* to be occupied,
- (p) required fire fighting access routes have been provided and are accessible, and
- (q) the *sewage system* has been completed and is operational.

(3) Where a *registered code agency* has been appointed to perform the functions described in clause 4.1(4)(b) or (c) of the Act in respect of the *construction* of the *building*, the *chief building official* or a person designated by the *chief building official* shall issue the permit referred to in Sentence (2) after receipt of a *certificate for the occupancy of a building not fully completed* issued by the *registered code agency* in respect of the *building*.

1.3.3.2. Conditions for Residential Occupancy

- (1) A person may occupy or permit to be occupied a *building* intended for *residential occupancy* that has not been fully completed at the date of occupation provided that
- (a) the *building*
 - (i) is of three or fewer *storeys* in *building height* and has a *building area* not exceeding 600 m²,
 - (ii) has not more than 1 *dwelling unit* above another *dwelling unit*,
 - (iii) has not more than 2 *dwelling units* sharing a common *means of egress*, and
 - (iv) has no accommodation for tourists,
 - (b) the following *building* components and systems are complete, operational and inspected:
 - (i) required *exits*, handrails and *guards*, fire alarm and detection systems, and *fire separations*,
 - (ii) required exhaust fume barriers and self-closing devices on doors between an attached or built-in garage and a *dwelling unit*, and
 - (iii) water supply, sewage disposal, lighting and heating systems,
 - (c) the following *building* components and systems are complete, operational, inspected and tested:
 - (i) *water systems*,
 - (ii) *building drains* and *building sewers*, and
 - (iii) *drainage systems* and *venting systems*, and
 - (d) where applicable, the *building* conforms to Article 3.1.1.3. or 9.1.1.7. of Division B.

r7 (2) Sentence (1) does not apply in respect of the occupancy of a *building* to which Article 1.3.3.4. applies.

1.3.3.3. Notification

r7 (1) Where a person has occupied or permitted the occupancy of a *building* under Article 1.3.3.1. or 1.3.3.2. such person shall notify the *chief building official* forthwith upon completion of the *building*.

r7 1.3.3.4. Occupancy Permit — Certain Buildings of Residential Occupancy

(1) No person shall occupy or permit to be occupied a *building* described in Sentence (4), or part of it, unless the *chief building official* or a person designated by the *chief building official* has issued a permit authorizing occupation of the *building* or part of it in accordance with Sentence (5).

(2) This Article applies in respect of the occupancy of a *building* described in Sentence (4) if a permit for the *construction* of the *building* has been applied for after December 31, 2011.

(3) This Article does not apply in respect of the occupancy of an existing *building*, or part of it, that has been subject to extension or material alteration or repair.

(4) A *building* referred to in Sentence (1) is a *building* intended for *residential occupancy* that,

- (a) is of three or fewer *storeys* in *building height* and has a *building area* not exceeding 600 m²,
- (b) has no accommodation for tourists,
- (c) does not have a *dwelling unit* above another *dwelling unit*, and
- (d) does not have any *dwelling units* sharing a common *means of egress*.

(5) The *chief building official* or a person designated by the *chief building official* shall issue a permit authorizing occupation of a *building* described in Sentence (4), where,

- (a) the structure of the *building* with respect to the *dwelling unit* to be occupied is substantially complete and ready to be used for its intended purpose,
- (b) the *building* envelope, including, but not limited to, cladding, roofing, windows, doors, assemblies requiring *fire-resistance ratings*, *closures*, insulation, *vapour barriers* and air barriers, with respect to the *dwelling unit* to be occupied, is substantially complete,

- (c) the walls enclosing the *dwelling unit* to be occupied conform to Sentence 9.25.2.3.(7) of Division B,
 - (d) site grading with respect to the *building* is substantially complete,
 - (e) required electrical supply is provided for the *dwelling unit* to be occupied,
 - (f) required fire fighting access routes to the *building* have been provided and are accessible,
 - (g) the following *building* components and systems are complete and operational for the *dwelling unit* to be occupied:
 - (i) required *exits*, floor access and egress systems, handrails, *guards*, *smoke alarms*, carbon monoxide detectors and *fire separations*, including, but not limited to, fire stopping,
 - (ii) required exhaust fume barriers and self-closing devices on doors between an attached or built-in garage and the *dwelling unit*, and
 - (iii) water supply, sewage disposal, lighting and heating systems,
 - (h) the following *building* components and systems are complete, operational and tested for the *dwelling unit* to be occupied:
 - (i) *water system*,
 - (ii) *building drain* and *building sewer*, and
 - (iii) *drainage system* and *venting system*,
 - (i) required *plumbing fixtures* in the *dwelling unit* to be occupied are substantially complete and operational, and
 - (j) where applicable, the *building* conforms to Article 9.1.1.7. of Division B with respect to the *dwelling unit* to be occupied.
- (6) Where a *registered code agency* has been appointed to perform the functions described in clause 4.1 (4)(b) or (c) of the Act in respect of the *construction* of a *building* described in Sentence (4), the *chief building official* or a person designated by the *chief building official* shall issue the permit referred to in Sentence (5) after receipt of a *certificate for the occupancy of a building described in Sentence 1.3.3.4.(4) of Division C* issued by the *registered code agency* in respect of the *building*.

1.3.4. Fire Department Inspection

1.3.4.1. Fire Department Approval

- (1) Subject to Sentence (2), if the council of a *municipality* assigns specific responsibility for the enforcement of any portion of this Code respecting fire safety matters to an *inspector* who is the chief of the fire department of the *municipality*, the *chief building official* shall not issue a permit to *construct a building* unless the *inspector* approves the drawings submitted with the application for the permit as complying with that portion of this Code.
- (2) If a *registered code agency* has been appointed under clause 4.1(4)(a) or (c) of the Act
- (a) a *municipality* shall not assign responsibility under Sentence (1) to the chief of the fire department with respect to a *building* for which the *registered code agency* has been appointed, and
 - (b) any assignment of responsibility under Sentence (1) with respect to a *building* for which the *registered code agency* is appointed shall be cancelled as of the date of the appointment.

1.3.5. Notices and Inspections

1.3.5.1. Prescribed Notices

- (1) This Article sets out the notices that are required under section 10.2 of the Act.
- (2) The person to whom a permit under section 8 of the Act is issued shall notify the *chief building official* or, where a *registered code agency* is appointed under the Act in respect of the *construction* to which the notice relates, the *registered code agency* of:
- (a) readiness to *construct* footings,
 - (b) substantial completion of footings and *foundations* prior to commencement of backfilling,

- (c) substantial completion of structural framing and ductwork and piping for heating and *air-conditioning* systems, if the *building* is within the scope of Part 9 of Division B,
- (d) substantial completion of structural framing and roughing-in of heating, ventilation, *air-conditioning* and air-contaminant extraction equipment, if the *building* is not a *building* to which Clause (c) applies,
- r₇ (e) substantial completion of insulation and *vapour barriers*,
- r₇ (e.1) substantial completion of *air barrier systems*,
- (f) substantial completion of all required *fire separations* and *closures* and all fire protection systems including standpipe, sprinkler, fire alarm and emergency lighting systems,
- (g) substantial completion of fire access routes,
- (h) readiness for inspection and testing of:
 - (i) *building sewers* and *building drains*,
 - (ii) *water service pipes*,
 - (iii) *fire service mains*,
 - (iv) *drainage systems* and *venting systems*,
 - (v) the *water distribution system*, and
 - (vi) *plumbing fixtures* and *plumbing appliances*,
- (i) readiness for inspection of suction and gravity outlets, covers and suction piping serving outlets of an *outdoor pool* described in Clause 1.3.1.1.(1)(j) of Division A, a *public pool* or a *public spa*,
- (j) substantial completion of the circulation / *recirculation system* of an *outdoor pool* described in Clause 1.3.1.1.(1)(j) of Division A, a *public pool* or *public spa* and substantial completion of the pool before it is first filled with water,
- (k) readiness to *construct* the *sewage system*,
- (l) substantial completion of the installation of the *sewage system* before the commencement of backfilling,
- r₇ (m) substantial completion of installation of *plumbing* not located in a structure, before the commencement of backfilling,
- r₇ (n) completion of *construction* and installation of components required to permit the issue of an occupancy permit under Sentence 1.3.3.1.(2) or to permit occupancy under Sentence 1.3.3.2.(1), if the *building* or part of the *building* to be occupied is not fully completed, and
- r₇ (o) completion of *construction* and installation of components required to permit the issue of an occupancy permit under Sentence 1.3.3.4.(5).

1.3.5.2. Additional Notices

- (1) A *principal authority* may pass a by-law or resolution or make a regulation under clause 7(1)(e) of the Act, as part of its responsibility for the enforcement of the Act, in order to establish time periods within which notice of one or more of the following stages of *construction* must be given:
 - (a) commencement of *construction* of the *building*,
 - (b) substantial completion of structural framing for each *storey*, if the *building* is a type of *building* that is within the scope of Parts of Division B other than Part 9 of Division B,
 - (c) commencement of *construction* of:
 - (i) masonry fireplaces and masonry *chimneys*,
 - (ii) factory-built fireplaces and allied *chimneys*,
 - (iii) *stoves*, *ranges*, *space heaters* and add-on *furnaces* using solid fuels and allied *chimneys*,
 - (d) substantial completion of interior finishes,
 - (e) substantial completion of heating, ventilating, *air-conditioning* and air-contaminant extraction equipment,
 - (f) substantial completion of exterior cladding,
 - (g) substantial completion of site grading,
 - r₇ (h) substantial completion of the pool deck and dressing rooms for a *public pool* or *public spa* and readiness for inspection of the emergency stop system for a *public pool* or *public spa*,
 - r₇ (i) completion and availability of drawings of the *building* as constructed, and
 - r₇ (j) completion of a *building* for which an occupancy permit is required under Article 1.3.3.4.