



# Ontario Building Code Energy Efficiency

By Dan Q. Xu, P.Eng, CBCO

# Occupancy Classification

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Group	Division	Description of Major Occupancies
A	1	Assembly occupancies for the performing arts
A	2	Assembly occupancies not elsewhere classified in Group A
A	3	Assembly occupancies of the arena type
A	4	Assembly occupancies in the open air
B	1	Detention occupancies
B	2	Care and treatment occupancies
B	3	Care occupancies
C	---	Residential occupancies
D	---	Business and personal services occupancies
E	---	Mercantile occupancies
F	1	High hazard industrial occupancies
F	2	Medium hazard industrial occupancies
F	3	Low hazard industrial occupancies

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# Part 9 vs Part 3

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## Part 9 Buildings

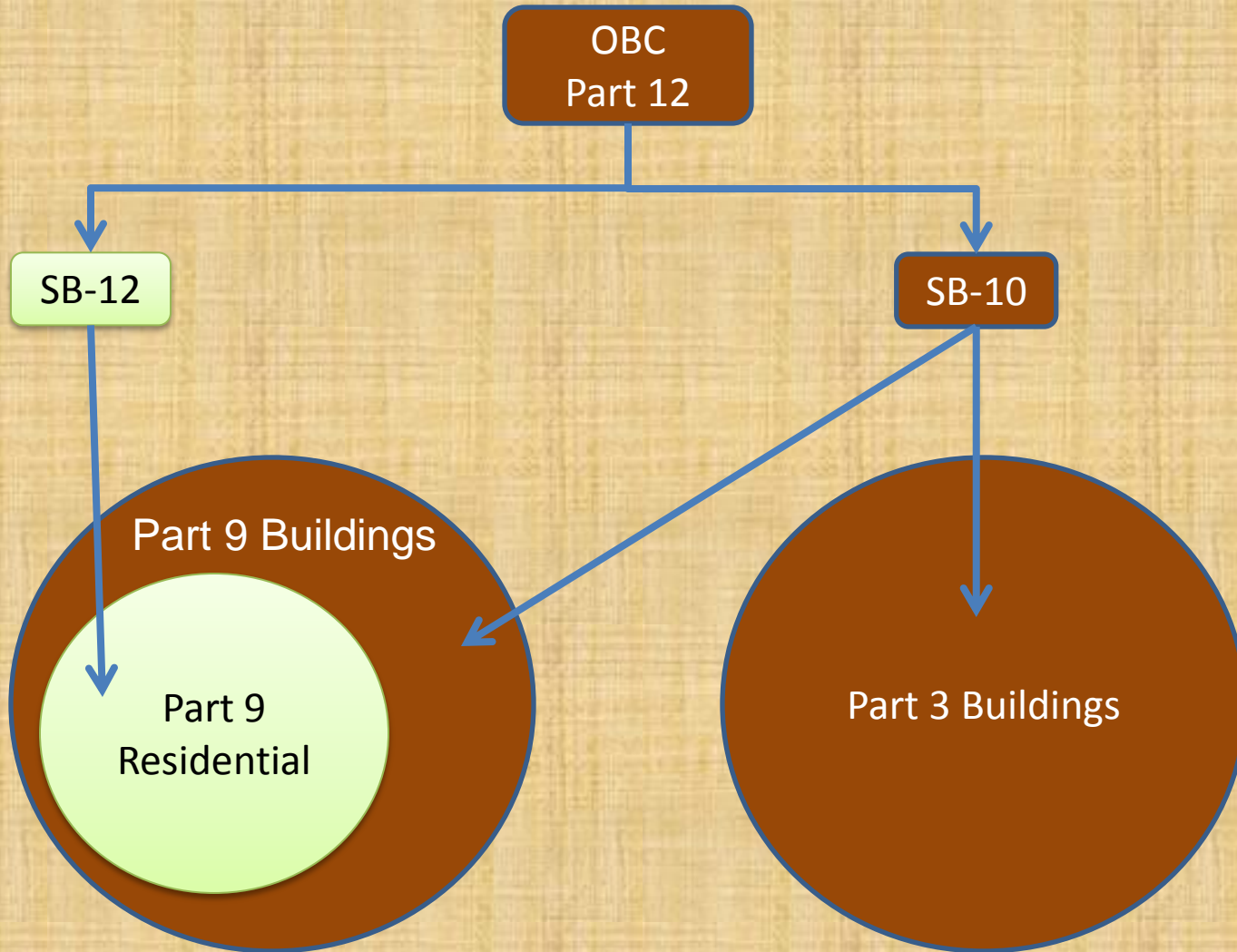
- (a) Three or fewer *storeys* in *building height*,
- (b) *building area* not exceeding 600 m<sup>2</sup>, and
- (c) used for *major occupancies* classified as,
  - (i) Group C, *residential occupancies*,
  - (ii) Group D, *business and personal services occupancies*,
  - (iii) Group E, *mercantile occupancies*, or
  - (iv) Group F, Divisions 2 and 3

## Part 3 buildings

All the rest of buildings

# Scope

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# Part 12 Resource Conservation and Environmental Integrity

## Objectives

- 12.2.1. Energy Efficiency Design
- 12.2.2. Carbon Dioxide Equivalents

### **CO<sub>2</sub>e Emission Factors**

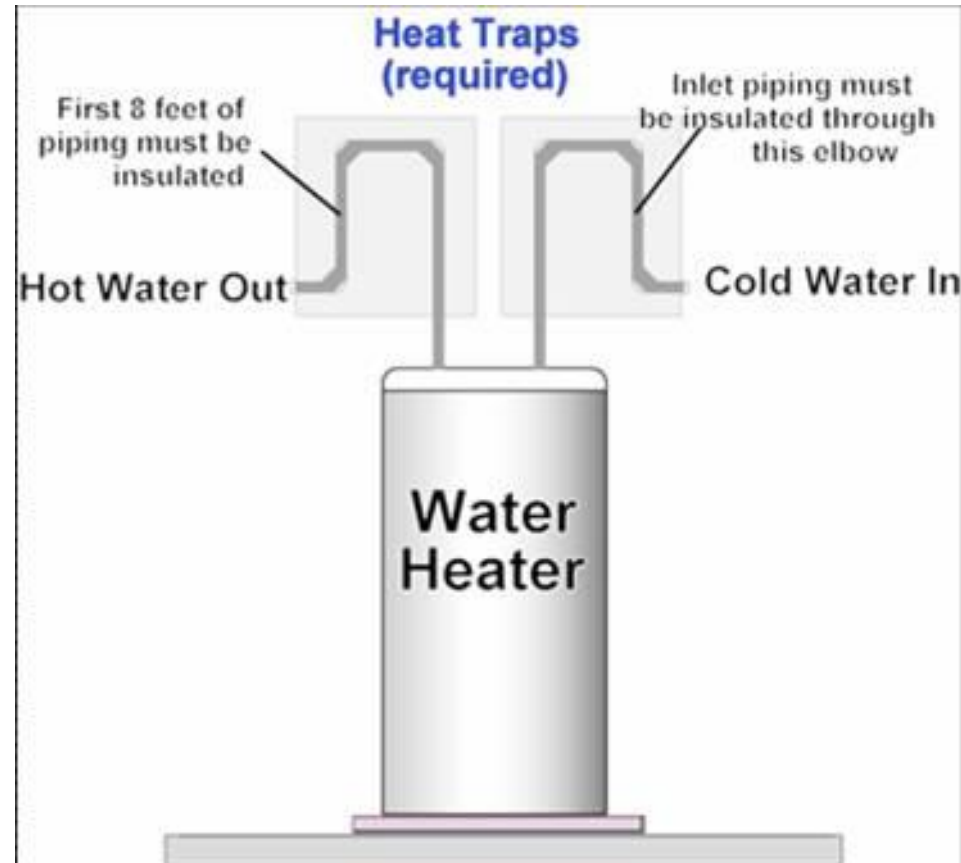
Building Energy Sources	CO <sub>2</sub> e, (kg/kWh)
Grid Delivered Electricity (marginal - based on natural gas)	0.400
LPG or Propane	0.274
Fuel Oil	0.312
Gasoline	0.309
Natural Gas	0.191

- 12.2.3. Peak Electric Demand
- 12.2.4. Motion Sensors

# Hot Water Tank

## 12.3.1.4. Hot Water Piping Insulation

1. heat traps on both inlet and outlet piping
2.  $\geq$  RSI 0.62 insulation over the first 2.5 m of the outlet piping
3.  $\geq$  RSI 0.62 insulation over inlet piping between the heat trap and the tank



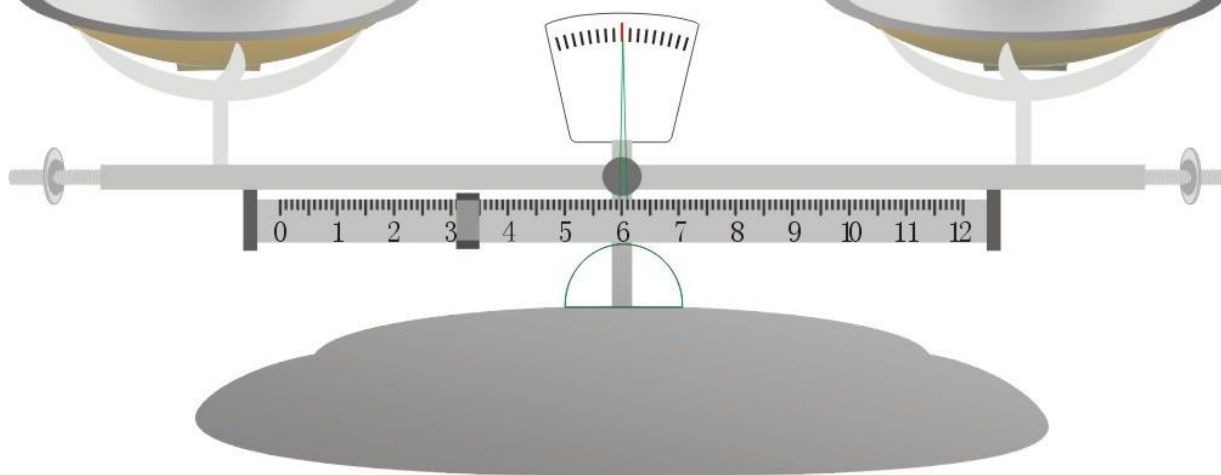
# Performance Methods

**Annual Energy Use  
based on Proposed  
Design**



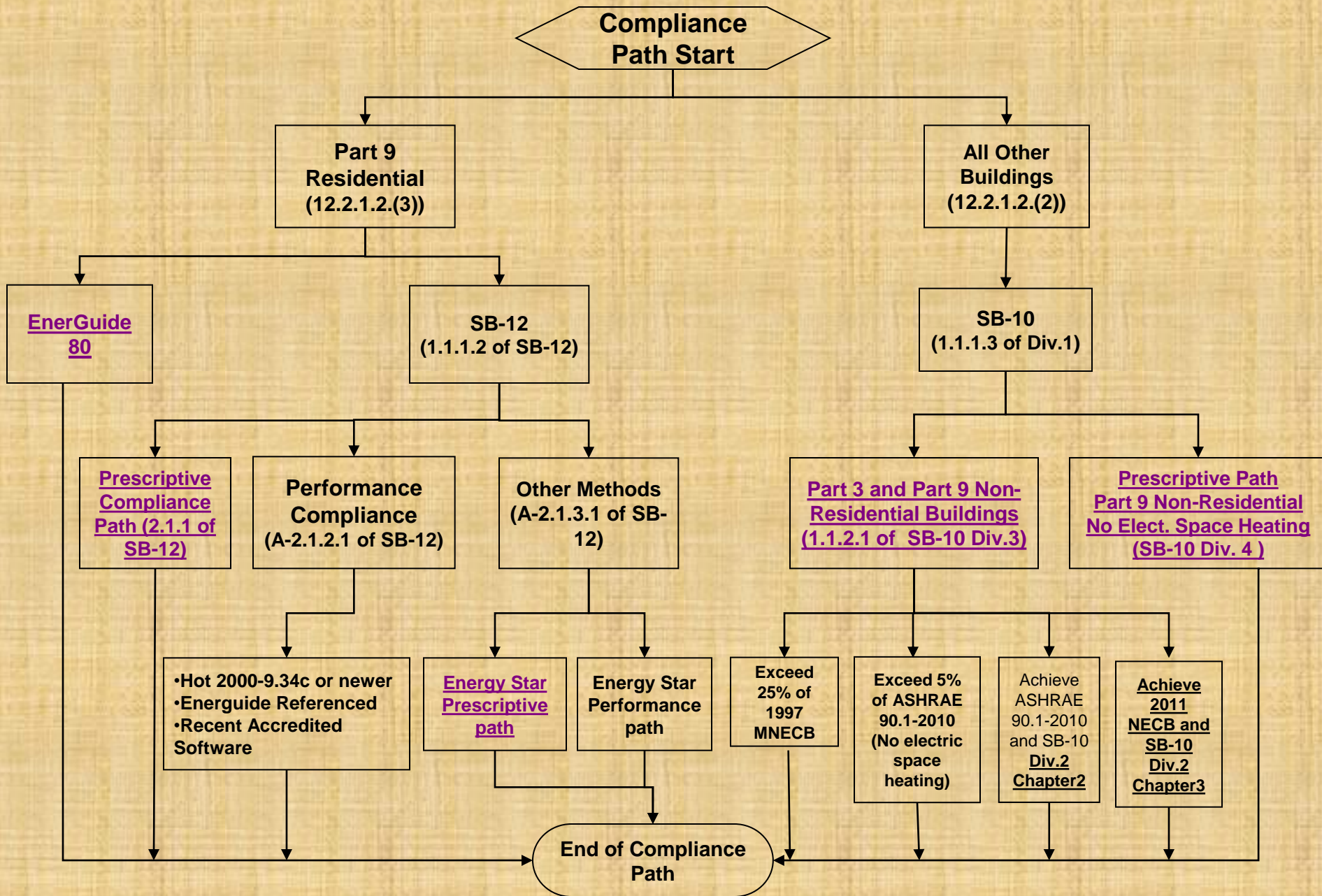
**Equal or  
Less  
Than**

**Annual Energy Use  
based on Prescriptive  
Requirements**





# Energy Efficiency Compliance Paths





# Design and Build

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- Energy Advisor
- *HOT2000* modeling software
- Blow door test
- Report
- Get EnerGuide Rating

# EnerGuide Rating

## Typical Energy Efficiency Ratings

Type of House	Rating
New House build to national building code standards	65-72
New house with some energy-efficiency improvements	73-79
High energy-efficient new house	80-90
House requiring little or no purchased energy	91-100



# ENERGUIDE

## Address

Identifies the house to which the rating applies.

123 EnerGuide Street Ottawa, ON K1A 1A1

## Scale

The low end of the scale represents a house that is built to minimum building code standards.

100 represents a house that is very well insulated, airtight, sufficiently ventilated and that requires no purchased energy (such as solar-powered home).

81



Level of energy efficiency / Niveau d'efficacité énergétique

Energy Efficiency Target / Objectif d'efficacité énergétique

## Estimated annual energy consumption Estimation de la consommation annuelle d'énergie

Electricity / Électricité: 9 493 kWh Gas / Gaz: 4 182 m<sup>3</sup>

File number / N<sup>o</sup> de dossier:

9901P00001

Builder / Constructeur:

ABC Construction

Service Organization / Organisme de service:

ABC Organization

Software Version / Version du logiciel:

9.35

Name and telephone number of the EnerGuide rating system energy advisor.  
Nom et numéro de téléphone du conseiller en efficacité énergétique pour le système de cotation EnerGuide.

Paul Alliance, 613-555-1234

Date: January 1, 2007

[newhomes.gc.ca](http://newhomes.gc.ca) / [maisonsnouvelles.gc.ca](http://maisonsnouvelles.gc.ca)

1-800-387-2000

## Energy Efficiency Rating

Allows comparison of energy performance with houses of the same size. The more efficient the house, the higher the rating number.

## Estimated Annual Energy Consumption for the House Under Standard Operating Conditions

Allows comparison of the energy consumption of the house to similar houses, and helps estimate energy costs.

## Software Version

The EnerGuide rating software edition that was used to determine the home's energy efficiency rating.

## Date

The date that the energy efficiency evaluation was conducted.

## Evaluated By

Name and telephone number of the energy advisor.



Natural Resources  
Canada

Resources naturelles  
Canada

Canada

# SB-12 Prescriptive Compliance Path

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- No software
- Zone 1 and Zone 2 (heating degree day 5000)
- Glazing assembly area from grade to top ceiling
  - Not including front door
  - 17% or less, table 2.1.1.2.A, 2.1.1.2.B, or 2.1.1.2.C
  - 17-22%, windows upgrading is required
  - Shower water energy recovery unit
  - More than 22% , go to performance path
- Easy to follow
- More restrictive



# Heating equipment efficiency

**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%
Column 1	2

- No AFUE requirement for
  - Solid burn and earth energy system
  - Other heating equipment



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

Component	Compliance Package												
	A	B	C	D	E	F	G	H	I	J	K <sup>(3)</sup>	L <sup>(4)</sup>	M <sup>(5)</sup>
Ceiling with Attic Space Minimum RSI (R)-Value <sup>(1)</sup>	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 <sup>(1)</sup>	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 <sup>(1)</sup>	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 <sup>(1)</sup>	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 <sup>(1)</sup>	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 <sup>(1)</sup>	0.88 (R5)	-	-	-	-	-	-	-	-	-	-	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value <sup>(1)</sup>	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 <sup>(1)</sup>	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 <sup>(2)</sup>	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 <sup>(2)</sup>	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% <sup>(8)</sup>
HRV <sup>(6), (7)</sup> Minimum Efficiency	-	-	-	-	55%	60%	60%	70%	55%	60%	-	-	-
Domestic Hot Water Heater Minimum EF	0.57	0.57	0.62	0.67	0.57	0.57	0.62	0.67	0.62	0.67	0.57	0.57	0.80 <sup>(8)</sup>
Column 1	2	3	4	5	6	7	8	9	10	11	12	13	14

**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 <sup>(1)</sup>	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 <sup>(1)</sup>	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)	5.46 (R31)
Exposed Floor Minimum RSI (R)-Value <sup>(1)</sup>	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 <sup>(1)</sup>	5.11 (R29)	5.11 (R29)	5.11 (R29)	4.75 (R27)	4.75 (R27)	4.75 (R27)
<i>Basement Walls</i> Minimum RSI (R)-Value <sup>(1)</sup>	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 <sup>(1)</sup>	-	-	-	-	-	-
Edge of Below Grade Slab $\leq$ 600 mm Below Grade Minimum RSI (R)-Value <sup>(1)</sup>	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 <sup>(1)</sup>	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 <sup>(2)</sup>	1.6	1.6	1.8	1.6	1.6	1.8
Skylights Maximum U-Value <sup>(2)</sup>	2.8	2.8	2.8	2.8	2.8	2.8
Space Heating Equipment Minimum AFUE	78%	84%	84%	84%	78%	84%
HRV <sup>(3)</sup> Minimum Efficiency	55%	55%	70%	55%	70%	75%
Domestic Hot Water Heater Minimum EF	-	-	-	-	-	-
Column 1	2	3	4	5	6	7

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

# Building Addition

**Table 2.1.1.10.**  
**Thermal Performance Requirements for Additions to Existing Buildings<sup>(3)</sup>**  
 Forming Part of Sentence 2.1.1.10.(2)

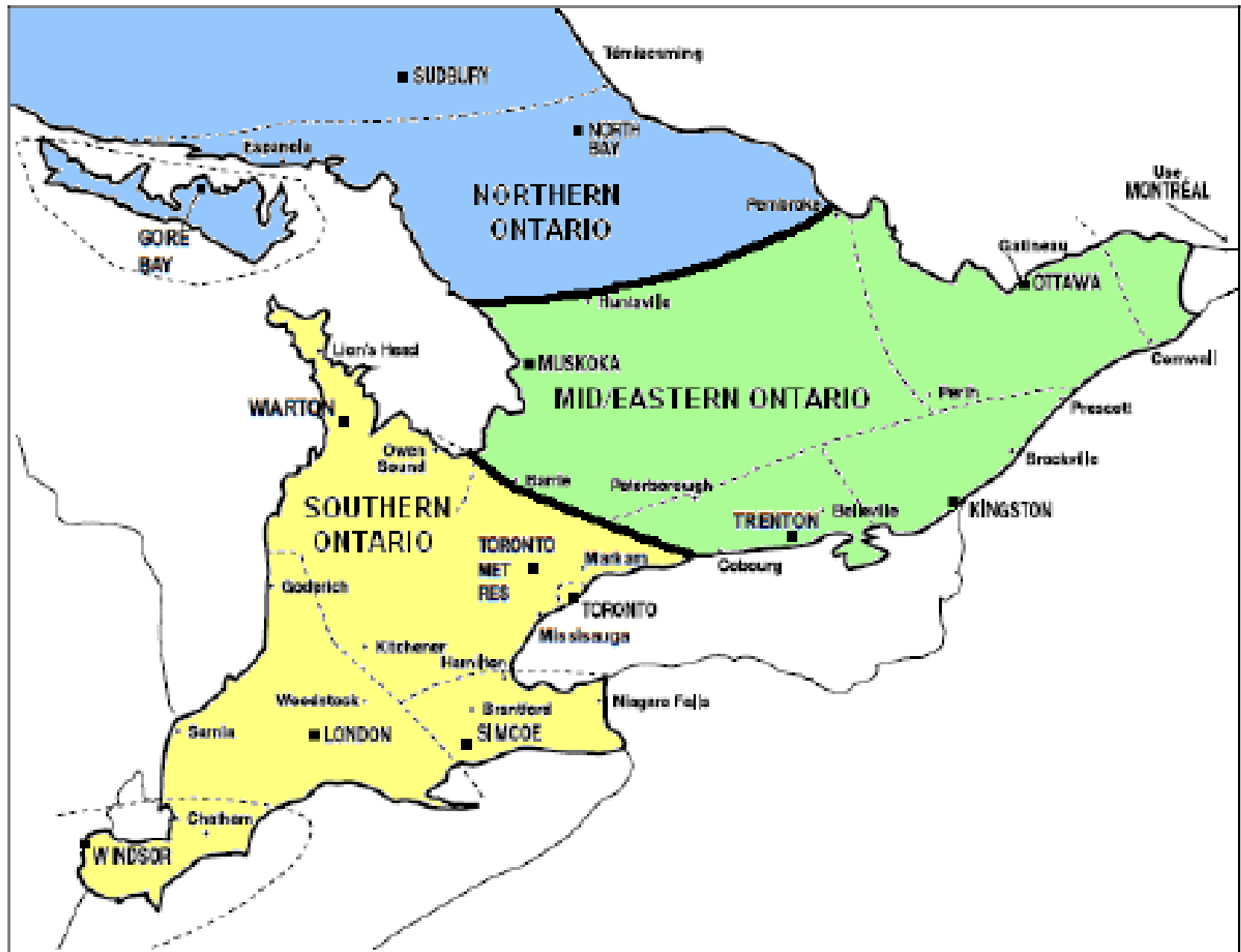
Component	Zone 1 Less than 5000 Degree-Days	Zone 2 5000 or more Degree-Days	Electric Space Heating Zones 1 and 2
Ceiling with Attic Space Minimum RSI (R)-Value <sup>(1)</sup>	8.81 (R50)	8.81 (R50)	8.81 (R50)
Ceiling Without Attic Space Minimum RSI (R)-Value <sup>(1)</sup>	5.46 (R31)	5.46 (R31)	5.46 (R31)
Exposed Floor Minimum RSI (R)-Value <sup>(1)</sup>	5.46 (R31)	5.46 (R31)	5.46 (R31)
Walls Above Grade Minimum RSI (R)-Value <sup>(1)</sup>	4.23 (R24)	4.23 (R24)	5.46 (R31)
<i>Basement</i> Walls Minimum RSI (R)-Value <sup>(1)</sup>	3.52 (R20)	3.52 (R20)	3.52 (R20)
Edge of Below Grade Slab $\leq$ 600 mm Below Grade Minimum RSI (R)-Value <sup>(1)</sup>	1.76 (R10)	1.76 (R10)	1.76 (R10)
Heated Slab or Slab $\leq$ 600 mm below grade Minimum RSI (R)-Value <sup>(1)</sup>	1.76 (R10)	1.76 (R10)	1.76 (R10)
Windows and Sliding Glass Doors Maximum U-Value <sup>(2)</sup>	1.8	1.6	1.6
Skylights Maximum U-Value <sup>(2)</sup>	2.8	2.8	2.8
Column 1	2	3	4

# Energy Star

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1. 3 zones
2. Prescriptive is slightly higher than OBC
3. Duct sealing
4. Energy Star appliance and lights
5. Performance path is the same as EnerGide 80

# Energy Star





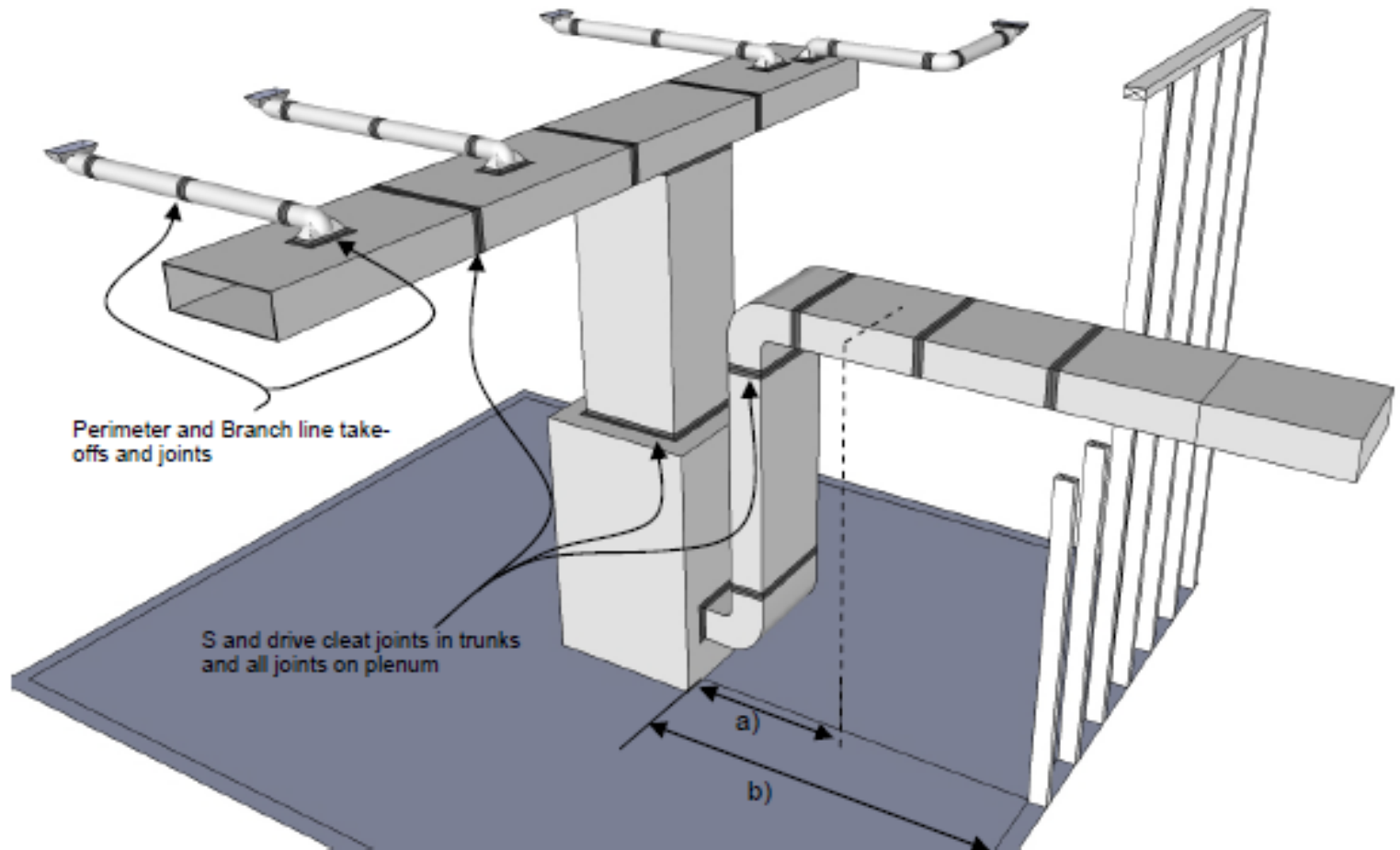
# Energy Star

		Detached Homes														
		Core BOP Id1	Trade-Offs										Core BOP Id2	Core BOP Id3	Core BOP Id4	
			Exterior Wall					Principal Exhaust				W.A.				
Element (refer to section for details)	Minimum Requirement		Id-xw-1.1.1	Id-xw-1.1.2	Id-xw-1.1.3	Id-xw-1.2.1	Id-xw-1.2.2	Id-px-1.1.1	Id-px-1.1.2	Id-px-1.2.1	Id-px-1.2.2					Id-px-1.3.1
Windows* and Ext. Doors*	Zone B Zone C	★	X	X	X	X	X	X	X	X	X	X	X	★	★	★
Window Area (4.2.1)	max. 13% of above grade wall area** 13% - 16% of above grade wall area	★	X	X	X	X	X	X	X	X	X	X	X	★	★	★
Ceiling with Attic* (4.3.2)	RSI 6.5 (R37) effective RSI 7.7 (R44) effective	★	X	X	X	X	X	X		X	X	X	X	★	★	★
Ceiling w/o Attic* (4.3.2)	RSI 4.7 (R26.5) effective	★	X	X	X	X	X	X	X	X	X	X	X	★	★	★
Exterior Walls* (4.3.2)	RSI 3.0 (R17.3) effective RSI 3.8 (R21.3) effective	★	X	X	X	X	X							★	★	★
Exposed Floors* (4.3.2)	RSI 5.1 (R29) effective	★	X	X	X	X	X	X	X	X	X	X	X	★	★	★
Basement Slab (4.3.1)	RSI 0.9 (R5) effective with thermal break RSI 0.9 (R5) effective***													★	★	★
Basement Walls* (4.3.1)	RSI 1.7 (R9.5) effective RSI 2.6 (R14.6) effective	★	X	X	X		X		X			X	X		★	NA
House Air Leakage (4.4)	max. 2.5 ACH@ 50PA or NLA <1.4 cm2/m2 or NLR ≤1.02 L/s/m² @50PA	★	X	X	X	X	X	X	X	X	X	X	X	★	★	★
Ventilation* (4.5)	HRV/ERV with efficiency of 60% at 0°C HRV/ERV with efficiency of 64% at 0°C HRV/ERV with efficiency of 67% at 0°C HRV/ERV with efficiency of 75% at 0°C Exhaust fan without heat recovery	★	X	X	X								X	★	★	★
Space Heating* (4.6)	Min. AFUE of 90% Min. AFUE of 92% Min. AFUE of 95% Min. AFUE of 96%	★	X	X	X	X		X		X	X	X	X	★	★	★
Ducts (4.7)	Sealed and in heated boundary	★	X	X	X	X	X	X	X	X	X	X	X	★	★	★
Water Heating* (4.8)	Fuel ES qualified or elect. min. EF 0.92 Fuel min. EF of 0.80 Fuel min. EF of 0.82 Instantaneous min. EF 0.90 Condensing storage tank min. TE 90%**** Min. 42% eff. DWHR serving 1 shower	★			X	X	X					X	X		★	★
Electrical Savings* (4.9)	Min. credit of 245 kWh/year Min. credit of 400 kWh/year Additional 700 kWh credit	★	X	X		X	X	X	X	X	X	X	X	★	★	★

**Table 3.2 Builder Option Packages for Southern Ontario – Attached Homes**

		Attached Homes				
		Core BOP Id5	Trade-Offs			Slab Core BOP Id6
			Exterior Wall			
			d-xw-5.1.1	d-xw-5.1.2	d-xw-5.1.3	
Element (refer to section for details)	Minimum Requirement					
Windows* and Ext. Doors*	Zone B	★	X	X	X	★
Window Area (4.2.1)	max. 13% of above grade wall area**	★	X	X	X	★
Ceiling with Attic ♦ (4.3.2)	RSI 6.6 (R37) effective	★	X	X	X	★
Ceiling w/o Attic ♦ (4.3.2)	RSI 4.7.5 (R26.5) effective	★	X	X	X	★
Exterior Walls ♦ (4.3.2)	RSI 3.0 (R17.3) effective		X	X	X	
	RSI 3.2 (R18.2) effective					★
	RSI 3.8 (R21.3) effective	★				
Exposed Floors ♦ (4.3.2)	RSI 5.1 (R29) effective	★	X	X	X	★
Basement Slab (4.3.1)	RSI 0.9 (R5) effective***					★
Basement Walls ♦ (4.3.1)	RSI 1.7 (R9.5) effective	★	X	X	X	NA
House Air Leakage (4.4)	max. 3.0 ACH@ 50PA or NLA < 2.0 cm²/m² or NLR ≤ 1.43 L/s/m²@50PA	★	X	X	X	★
Ventilation* (4.5)	Exhaust fan without heat recovery	★	X	X	X	★
Space Heating* (4.6)	Min. AFUE of 90%	★	X	X	X	★
Ducts (4.7)	Sealed and in heated boundary	★	X	X	X	★
Water Heating* (4.8)	Fuel ES qualified or elect. min. EF 0.92	★			X	
	Fuel min. EF of 0.80		X			
	Instantaneous min. EF of 0.90			X		★
Electrical Savings* (4.9)	Min. credit of 245 kWh/year	★	X	X	X	★
	Additional 700 kWh credit				X	

Figure 4.7 Duct Sealing



# Climate Zones

- Part 9 non-residential
  - Zone one and zone two
- Part 3

Climate Zone Definitions for Ontario  
(This Table is to be used in conjunction with Tables SB5.5-5 to SB5.5-7)

Zone Number	Thermal Criteria
Zone 5	$HDD18 < 4000^{\circ}C$
Zone 6	$4000^{\circ}C \leq HDD18 < 5000^{\circ}C$
Zone 7	$HDD18 \geq 5000^{\circ}C$
Column 1	2

# **Part 3 Building and Part 9 Non- Residential**

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1. Exceed 25% of MNECB 1997 (performance path only) Software: EE-4
2. Exceed 5% of ASHRAE 90.1-2010 Software: DOE, Equest, Canquest, Trane, Carrier, and others
3. NECB 2011
4. Prescriptive Path / Energy Cost Budget Method (ASHRAE 90.1-2010 & SB-10 Div.3)

# **SB-10 Div. 3 Prescriptive Path (ASHRAE 90.1+SB-10)**

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- Architectural:
  - Building Envelope
- Mechanical:
  - HVAC
  - Water heating
  - Insulation
- Electrical
  - Lighting (internal and external)
  - Motor efficiency





**TABLE SB5.5-5 (See Appendix A.)**  
**(Supersedes Table 5.5-5 in ANSI/ASHRAE/IES 90.1)**  
**Building Envelope Requirements for Climate Zone 5 (A, B, C) (I-P)**

Opaque Elements	Nonresidential		Residential		Semiheated	
	Assembly	Insulation <sup>a</sup>	Assembly	Insulation <sup>a</sup>	Assembly	Insulation <sup>a</sup>
	Max. U	Min. RSI-Value	Max. U	Min. RSI-Value	Max. U	Min. RSI-Value
<b>Roofs</b>						
Insulation Entirely above Deck	U-0.039	R-25.0 ci	U-0.039	R-25.0 ci	U-0.093	R-10.0 ci
Metal Building	U-0.035	R-19.0 + R-11.0 Ls	U-0.035	R-19.0 + R-11.0 Ls	U-0.068	R-13.0 + R- 19.0
Attic and Other	U-0.021	R-49.0	U-0.021	R-49.0	U-0.034	R-30.0
<b>Walls, Above Grade</b>						
Mass	U-0.080	R-13.3 ci	U-0.071	R-15.2 ci	U-0.123	R-7.6 ci
Metal Building	U-0.052	R-13.0 + R-13.0 ci	U-0.052	R-13.0 + R-13.0 ci	U-0.079	R-13.0 + R-6.5 ci
Steel Framed	U-0.055	R-13.0 + R-10.0 ci	U-0.055	R-13.0 + R-10.0 ci	U-0.084	R-13.0 + R-3.8 ci
Wood Framed and Other	U-0.051	R-13.0 + R-7.5 ci	U-0.045	R-13.0 + R-10.0 ci	U-0.064	R-13.0 + R-3.8 ci
<b>Wall, Below Grade</b>						
Below Grade Wall	C-0.092	R-10.0 ci	C-0.092	R-10.0 ci	C-0.119	R-7.5 ci
<b>Floors</b>						
Mass	U-0.064	R-12.5 ci	U-0.057	R-14.6 ci	U-0.107	R-6.3 ci
Steel Joist <sup>c</sup>	U-0.032	R-38.0	U-0.032	R-38.0	U-0.038	R-30.0
Wood Framed and Other <sup>c</sup>	U-0.026	R-30.0 + R-7.5 ci	U-0.026	R-30.0 + R-7.5 ci	U-0.033	R-30.0
<b>Slab-On-Grade Floors</b>						
Unheated	F-0.540	R-10.0 for 24 in.	F-0.520	R-15.0 for 24 in.	F-0.540	R-10.0 for 24 in.
Heated	F-0.440	R-15.0 for 36 in. + R-5.0 ci below	F-0.440	R-15.0 for 36 in. + R-5.0 ci below	F-0.900	R-10.0 for 24 in.
<b>Opaque Doors</b>						
Swinging	U-0.400		U-0.400		U-0.600	
Non-Swinging	U-0.400		U-0.400		U-0.500	
<b>Fenestration</b>	Assembly	Assembly	Assembly	Assembly	Assembly	Assembly
	Max. U	Max. SHGC	Max. U	Max. SHGC	Max. U	Max. SHGC
<b>Vertical Fenestration, 0% - 40% of Wall</b>						
Nonmetal framing: all <sup>a</sup>	U-0.25	0.35	U-0.25	0.40	U-0.55	NR
Metal framing: curtainwall / storefront <sup>b</sup>	U-0.35		U-0.35		U-0.60	
Metal framing: entrance door <sup>b</sup>	U-0.70		U-0.70		U-0.80	
Metal framing: all other <sup>b</sup>	U-0.45		U-0.45		U-0.65	
<b>Skylight with Curb, Glass, % of Roof</b>						
0% - 5.0%	U-0.67	0.36	U-0.67	0.36	U-1.98	NR
<b>Skylight with Curb, Plastic, % of Roof</b>						
0% - 5.0%	U-0.69	0.34	U-0.69	0.34	U-1.90	NR

# SB-10 Div. 4 Part 9 Non- Residential Prescriptive Path

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- Non-electrical Space Heating (10%)
- Not more than 40% of fenestration
- Not more than 5% of skylight

**Table 1.1.1.2**  
**Building Envelope Requirements Based on Degree Day Zones (SI)**

Building Assembly – Opaque Elements	Criteria				Design	
	Zone 1 Less than 5000 Degree Days		Zone 2 5000 or more Degree Days		<i>Insert design thermal resistance</i>	
	Assembly Max U-Value <sup>(1)</sup>	Insulation Min. RSI-Value	Assembly Max U-Value <sup>(1)</sup>	Insulation Min. RSI-Value	Value	RSI or U/C Value?
Roofs Without Attic Space – Insulation Above Deck	U-0.181	5.28ci	U-0.158	6.16ci		<input type="checkbox"/> RSI <input type="checkbox"/> U
Roofs With Attic Space and Other	U-0.119	8.8	U-0.096	10.56		<input type="checkbox"/> RSI <input type="checkbox"/> U
Walls Above Grade	U-0.312	2.28+1.76ci	U-0.312	2.28+1.76ci		<input type="checkbox"/> RSI <input type="checkbox"/> U
Walls Below Grade	C-0.522 <sup>(2)</sup>	1.76ci	C-0.522 <sup>(2)</sup>	1.76ci		<input type="checkbox"/> RSI <input type="checkbox"/> C
Exposed Floors – Lightweight Framing <sup>(3)</sup>	U-0.181	6.69 <sup>(3)</sup>	U-0.181	6.69 <sup>(3)</sup>		<input type="checkbox"/> RSI <input type="checkbox"/> U
Exposed Floors – Mass	U-0.323	2.57ci	U-0.244	3.52ci		<input type="checkbox"/> RSI <input type="checkbox"/> U
Slab on Grade Floors (perimeter + below slab) – Unheated		2.64 for 600mm		2.64 for 600mm+0.88ci		<input type="checkbox"/> RSI <input type="checkbox"/> U
Slab on Grade Floors (perimeter + below slab) – Heated		2.64 for 900mm+0.88ci		3.52 for 900mm+0.88ci		<input type="checkbox"/> RSI <input type="checkbox"/> U
<b>Fenestration</b>	<b>Assembly Max U-Value <sup>(1)</sup></b>	<b>Assembly Max SHGC</b>	<b>Assembly Max U-Value <sup>(1)</sup></b>	<b>Assembly Max SHGC</b>	<b>Design U Value</b>	<b>Design SHGC</b>
Vertical Fenestration – Windows	U-1.987	0.40	U-1.703	0.45		
Skylight with curb	U-3.917	0.49	U-3.917	0.50		
Skylight without curb	U-2.555	0.46	U-2.555	0.46		

# Exceptions

Process and production, 10°C, 12W/m<sup>2</sup>, etc.

Table 1.2.1.1.

Examples of Occupancies Exempt from Compliance with ANSI/ASHRAE/IESNA Standard 90.1 and MNECB

GROUP A, DIVISION 4	GROUP F, DIVISION 1	GROUP F, DIVISION 2	GROUP F, DIVISION 3
Amusement Park Structures (not elsewhere classified) Bleachers Grandstands Reviewing Stands Stadia	Bulk Plants for Flammable Liquids Bulk Storage Warehouses for Hazardous Substances Cereal Mills Chemical Manufacturing or Processing Plants Distilleries Dry Cleaning Plants Feed Mills Flour Mills Grain Elevators Lacquer Factories Paint, Varnish and Pyroxylin Product Factories Rubber Processing Plants Spray Painting Operations Waste Paper Processing Plants	Dry Cleaning Establishments not using flammable or explosive solvents or cleaners Electrical Substations Helicopter Landing Areas on Roofs Laundries, except self-service Planing Mills Printing Plants Repair Garages Woodworking Factories	Creameries Power Plants Open-air Parking Garages Pumping Stations
GROUP C  Part 9 Buildings <sup>(1)</sup> Camps for Housing Workers (Part 3 & 9 Buildings) Recreational Camps			
Column 1	2	3	4

# Future

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- Simplifying the approach options
- January 1, 2015, furnaces installed in Part 9 dwelling units will be required to have brushless direct current motor.
- January 1<sup>st</sup> of 2017, Energy efficiency
  - 15% for part 9 residential
  - 13% for other buildings
- Year 2030: Net zero



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