

Comparison of the  
Model National Energy Code of Canada for Houses 1997  
with Energy-Related Requirements  
in Provincial Building Codes

prepared by

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for the

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There has been much opposition by the home building industry to the possible adoption of the Model National Energy Code for Houses by the provinces. It is possible that those leading this opposition are not aware that the energy-related characteristics of the vast majority of new houses in Canada are already regulated to some extent by provisions in provincial building codes or other provincial regulations.

The provincial codes in Ontario, Manitoba, Alberta and British Columbia include energy-related requirements not found in the National Building Code. In addition, Quebec has a separate regulation that applies to all new housing built in the province. Based on 1997 CMHC new housing start statistics, this means **92% of new housing** which would fall within the scope of the Model National Energy Code for Houses is already regulated to some extent regarding its energy-related characteristics.

But to what extent is it regulated and how do these provincial requirements compare with those in the Model National Energy Code for Houses? The Appendix presents the provincial requirements for each of the provinces mentioned above along with the regionally-sensitive requirements of the Model National Energy Code for Houses. The following are the non-regionally-sensitive requirements of the Model National Energy Code for Houses' principal requirements that would apply to all typical houses.

**Note that, regarding minimum thermal resistance values for building assemblies, the provincial requirements deal with the nominal RSI (or R) value of the insulation whereas the Model National Energy Code for Houses deals with the overall thermal resistance of the assembly, taking into account the contributions of interior finishes and exterior sheathings and claddings but also taking into account thermal bridging through the framing. Thus only rough comparisons can be made.**

## Model National Energy Code for Houses

Specific requirements:

- 3.2.4. Airtightness
  - good air barrier practice required
  - a separate manual is provided
  - subject to test if manual not followed – NLA  $2.0 \text{ cm}^2/\text{m}^2$
- 3.3.1.4. Doors and Access Hatches
  - door minimum ER –20
  - attic hatch same RSI as ceiling
- 3.3.1.5. Amount of Window and Other Glazed Areas
  - must not exceed 20% of floor area (few houses exceed this)
- 4.2.2.2. Exterior Lighting Controls for Individual Dwelling Units
  - must be controlled by photocell and a timer or motion detector
- 5.2.2.2. Provision for Balancing of Ducts
  - the normal balancing dampers are required
- 5.2.2.3.(3) Outside Air Ducts
  - required to be insulated
- 5.2.3.1. Required Dampers
  - motorized damper required on outdoor air intake
- 5.2.8.1. Thermostatic Controls
  - must be able to be set as low as  $13^\circ\text{C}$
- 5.2.8.2. Reduction of Heating to Individual Rooms
  - dampers required at heating outlets
- 5.2.10. Equipment Efficiency

- only equipment complying with the Code will be available since the Code's requirements are based on provincial energy efficiency acts
- 6.2.3.1. Heat Traps
  - required on water heater piping
- 6.2.3.2. Water Heater Piping Insulation
  - required to heat trap and 2 m beyond
- 6.2.4.1. Temperature Controls
  - required on water heaters
- 6.2.4.2. Shutdown Controls
  - required on water heaters
- 6.2.5.1. Showers
  - low flow shower heads required
- 7.2.1.1. Metering
  - electricity supply to each dwelling unit must be individually metered
- 7.2.2.1. Power Receptacles
  - where there are exterior electrical outlets, at least one must be switched

APPENDIX  
COMPARISONS BY PROVINCE

# QUEBEC

## Regulation Respecting Energy Conservation in New Buildings (1983, 1992)

Table (s.34)  
**Minimum Thermal Resistance (Rt), (m<sup>2</sup>•°C)/W**

Building Components	Zones					
	A	B	C	D	E	F
Roofs or ceilings separating a heated space from an unheated space or the outside air	5.3 (R30.1)	5.6 (R31.8)	6.0 (R34.1)	6.3 (R35.8)	6.8 (R38.6)	7.1 (R40.3)
Walls above ground level (other than foundation walls) separating a heated space from an unheated space or the outside air	3.4 (R19.3)	3.6 (R20.5)	3.8 (R21.6)	4.0 (R22.7)	4.2 (R23.9)	4.5 (R25.6)
Foundation walls separating a heated space from an unheated space, the outside air or the adjacent ground	2.2 (R12.5)	2.2 (R12.5)	2.2 (R12.5)	2.2 (R12.5)	2.2 (R12.5)	2.2 (R12.5)
Floors separating a heated space from an unheated space or the outside air	4.7 (R26.7)	4.7 (R26.7)	4.7 (R26.7)	4.7 (R26.7)	4.7 (R26.7)	4.7 (R26.7)

**Swing Doors**            2.5L/s.m<sup>2</sup> at 75 Pa or weatherstripped  
 RSI 0.7 (R4) or unheated vestibule

**Sliding Doors**        2.5L/s.m<sup>2</sup> at 75 Pa  
 Zones A, B, C and D: RSI 0.35 (R2)  
 Zones E and F: RSI 0.50 (R 2.8)

**Windows**                0.77 L/s.m at 75 Pa  
 Zones A, B, C and D: RSI 0.35 (R2)  
 Zones E and F: RSI 0.50 (R 2.8)

**Airtightness**            as per NBC

### 1997 MNECH

#### Québec - Administrative Region A (existing Zone A)

Principal Heating Source		
All Sources	--	--

Table 3.3.1.1. Forming Part of Sentence 3.3.1.1.(1) <b>Above-ground Building Assemblies</b>	Minimum Effective Thermal Resistance RSI-value (m <sup>2</sup> •°C/W)		
Roofs (see Appendix Note A-3.3.1.1.): Type I - attic-type roofs	7.00	--	--
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	4.30	--	--
Walls	4.10	--	--
Floors	4.60	--	--

<b>Table 3.3.1.3.</b> Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	<b>Minimum Energy Rating ER (W/m<sup>2</sup>)</b>		
Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.): Operable or fixed glazing with sash	-13.0	--	--
Fixed glazing without sash	-3.0	--	--
	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>•°C)</b>		
Windows and other glazed areas outside the scope of CSA Standard A440.2	2.60	--	--

<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Walls	3.10 @ full wall area	--	--
Floors-on-ground: Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)	1.08 @ full floor area	--	--
Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.08 @ perimeter	--	--

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	required	--	--

## Québec - Administrative Region B (existing Zones B, C and D)

<b>Principal Heating Source</b>		
All Sources	--	--

<b>Table 3.3.1.1.</b> Forming Part of Sentence 3.3.1.1.(1) <b>Above-ground Building Assemblies</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Roofs (see Appendix Note A-3.3.1.1.): Type I - attic-type roofs	7.00	--	--
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	5.20	--	--
Walls	4.10	--	--
Floors	5.20	--	--

<b>Table 3.3.1.3.</b> Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	<b>Minimum Energy Rating ER (W/m<sup>2</sup>)</b>		
Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.): Operable or fixed glazing with sash	-13.0	--	--
Fixed glazing without sash	-3.0	--	--
	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>•°C)</b>		
Windows and other glazed areas outside the scope of CSA Standard A440.2	2.60	--	--

<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Walls	3.10 @ full wall area	--	--
Floors-on-ground; Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)	1.08 @ full floor area	--	--
Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.08 @ perimeter	--	--

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	required	--	--

## Québec - Administrative Region C (existing Zones E and F)

<b>Principal Heating Source</b>		
All Sources	--	--

<b>Table 3.3.1.1.</b> Forming Part of Sentence 3.3.1.1.(1) <b>Above-ground Building Assemblies</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Roofs (see Appendix Note A-3.3.1.1.): Type I - attic-type roofs	8.80	--	--
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	7.10	--	--
Walls	4.70	--	--
Floors	7.10	--	--

<b>Table 3.3.1.3.</b> Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	<b>Minimum Energy Rating ER (W/m<sup>2</sup>)</b>		
Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.): Operable or fixed glazing with sash  Fixed glazing without sash	-10.0  -0.0	--  --	--  --
Windows and other glazed areas outside the scope of CSA Standard A440.2	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>•°C)</b>		
	2.40	--	--

<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Walls	3.10 @ full wall area	--	--
Floors-on-ground: Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)  Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.90 @ full floor area  1.50 @ perimeter	--  --	--  --

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	required	--	--

# ONTARIO

1997 OBC

Table 9.25.2.1.  
**Minimum Thermal Resistance of Insulation to be Installed based on Degree Day Zones**  
 Forming Part of Sentence 9.25.2.1.(4)

Building Element Exposed to the Exterior or to Unheated Space	RSI (R) Value Required		
	Zone 1 Less than 5000	Zone 2 5000 or more	Electric Space Heating Zone 1 & 2
Ceiling below attic or roof space	5.40 (R31)	6.70 (R38)	7.00 (R40)
Roof Assembly without attic or roof space	3.52 (R20)	3.52 (R20)	3.87 (R22)
Wall other than foundation wall	3.00 (R17)	3.87 (R22)	4.70 (R27)
Foundation walls enclosing heated space	1.41 (R8)	2.11 (R12)	3.25 (R19)
Floor, other than slab-on-ground	4.40 (R25)	4.40 (R25)	4.40 (R25)
Slab-on-ground containing pipes or heating ducts	1.76 (R10)	1.76 (R10)	1.76 (R10)
Slab-on-ground not containing pipes or heating ducts	1.41 (R8)	1.41 (R8)	1.41 (R8)

- Swing Doors**      11.6 X 10<sup>-4</sup> m<sup>3</sup>/s.m at 75 Pa  
RSI 0.7 (R4)
- Sliding Doors**    38 X 10<sup>-4</sup> m<sup>3</sup>/s.m<sup>2</sup> at 75 Pa  
RSI 0.30 (R1.7)  
-13 ER for electric heat
- Windows**            0.775 dm<sup>3</sup>/s.m at 75 Pa  
RSI 0.30 (R1.7)  
-13 ER for electric heat
- Airtightness**        as per NBC
- Heat Recovery**      required if solid fuel appliances are present

1997 MNECH

## Ontario - Administrative Region A

Principal Heating Source		
Electricity, Other	Propane, Oil Heat Pump	Nat. Gas

Table 3.3.1.1. Forming Part of Sentence 3.3.1.1.(1) Above-ground Building Assemblies	Minimum Effective Thermal Resistance RSI-value (m <sup>2</sup> •°C/W)		
Roofs (see Appendix Note A-3.3.1.1.): Type I - attic-type roofs	8.80	7.00	5.60
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	5.20	4.30	4.30
Walls	4.40	3.00	2.90
Floors	5.20	4.60	4.60

Table 3.3.1.3. Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	Minimum Energy Rating ER (W/m <sup>2</sup> )		
	Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.):		
Operable or fixed glazing with sash	-10.0	-13.0	-13.0
Fixed glazing without sash	0.0	-3.0	-3.0
	Maximum Overall Thermal Transmittance U-value (W/m <sup>2</sup> •°C)		
Windows and other glazed areas outside the scope of CSA Standard A440.2	2.40	2.60	2.60

Table 3.3.2.1. Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	Minimum Effective Thermal Resistance RSI-value (m <sup>2</sup> •°C/W)		
	Walls	3.10 @ full wall area	3.10 @ full wall area
Floors-on-ground: Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)	1.90 @ full floor area	1.90 @ full floor area	1.90 @ full floor area
Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.60 @ full floor area	1.60 @ full floor area	1.60 @ full floor area

Table 5.3.1.1.A. Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	required	required	--

## Ontario - Administrative Region B

Principal Heating Source		
Electricity, Other	Propane, Oil Heat Pump	Nat. Gas

Table 3.3.1.1. Forming Part of Sentence 3.3.1.1.(1) <b>Above-ground Building Assemblies</b>	Minimum Effective Thermal Resistance RSI-value (m <sup>2</sup> •°C/W)		
Roofs (see Appendix Note A-3.3.1.1.): Type I - attic-type roofs	10.60	8.80	7.00
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	7.10	4.30	4.30
Walls	4.70	4.10	3.30
Floors	7.10	4.60	4.60

<b>Table 3.3.1.3.</b> Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	<b>Minimum Energy Rating ER (W/m<sup>2</sup>)</b>		
	Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.): Operable or fixed glazing with sash Fixed glazing without sash	-10.0	-13.0
	0.0	-3.0	-3.0
	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>•°C)</b>		
Windows and other glazed areas outside the scope of CSA Standard A440.2	2.40	2.60	2.60

<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
	Walls	3.10 @ full wall area	3.10 @ full wall area
Floors-on-ground; Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)	1.90 @ full floor area	1.90 @ full floor area	1.90 @ full floor area
Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.60 @ full floor area	1.60 @ full floor area	1.60 @ full floor area

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	required	required	required

# MANITOBA

## 1998 Manitoba Amendments to 1995 NBC

Table 9.25.5.2.

### Minimum Thermal Resistance for the Building Envelope Forming Part of Article 9.25.5.2.

Building Assembly	Southern Manitoba	Northern Manitoba
Foundation Walls -Interior	RSI-2.1 (R-12) (gas heat) RSI-3.5 (R-20) (other types)	RSI-4.2 (R-24)
-Exterior	RSI-2.1 (R-12)	RSI-3.0 (R-17)
Floors on Ground -Heated	RSI-0.88 R-5) Full Area	RSI-0.88 (R-5) Full Area
-Unheated (less than 0.6 m below grade)	RSI-0.88 (R-5) 1m Perimeter	RSI-0.88 (R-5) 1m Perimeter
Unheated (0.6m or more below grade)	no requirement	no requirement
Floors Above Unheated Spaces	RSI-3.4 (R-20)	RSI-5.6 (R-32)
Walls Above Grade	RSI-3.5 (R-20)	RSI-4.6 (R-26)
Roofs -Attics	RSI-7.0 (R-40)	RSI-8.8 (R-50)
-Sloped Ceilings	RSI-7.0 (R-40) Trusses/I-Joists RSI-4.9 (R28) Solid Lumber	RSI-7.0 (R-40) Trusses/I-Joists RSI-4.9 (R28) Solid Lumber

Airtightness NLA 2.0 cm<sup>2</sup>/m<sup>2</sup> (same as 1997 MNECH)

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## 1997 MNECH

### Manitoba - Administrative Region A

Principal Heating Source		
Electricity, Oil, Propane, Other	Nat. Gas, Ground Source Heat Pump	--

Table 3.3.1.1. Forming Part of Sentence 3.3.1.1.(1) Above-ground Building Assemblies	Minimum Effective Thermal Resistance RSI-value (m <sup>2</sup> ·°C/W)		
Roofs (see Appendix Note A-3.3.1.1.): Type I - attic-type roofs	8.80	7.00	--
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	4.30	4.30	--
Walls	4.10	3.00	--
Floors	4.60	4.60	--

<b>Table 3.3.1.3.</b> Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	<b>Minimum Energy Rating ER (W/m<sup>2</sup>)</b>		
Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.): Operable or fixed glazing with sash	-6.0	-6.0	--
Fixed glazing without sash	4.0	4.0	--
	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>•°C)</b>		
Windows and other glazed areas outside the scope of CSA Standard A440.2	2.20	2.20	--

<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Walls	3.10 @ full wall area	3.10 @ full wall area	--
Floors-on-ground; Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)	1.08 @ full floor area	1.08 @ full floor area	--
Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.08 @ perimeter	1.08 @ perimeter	--

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	required	required	--

## Manitoba - Administrative Region B

<b>Principal Heating Source</b>		
Electricity, Oil, Propane, Other	Nat. Gas, Ground Source Heat Pump	--

<b>Table 3.3.1.1.</b> Forming Part of Sentence 3.3.1.1.(1) <b>Above-ground Building Assemblies</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Roofs (see Appendix Note A-3.3.1.1.): Type I - attic-type roofs	10.60	8.80	--
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	5.20	4.30	--
Walls	4.40	4.10	--
Floors	5.20	4.60	--

<b>Table 3.3.1.3.</b> Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	<b>Minimum Energy Rating ER (W/m<sup>2</sup>)</b>		
Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.): Operable or fixed glazing with sash	-3.0	-3.0	--
Fixed glazing without sash	7.0	7.0	--
	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>·°C)</b>		
Windows and other glazed areas outside the scope of CSA Standard A440.2	2.00	2.00	--

<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>·°C/W)</b>		
Walls	3.10 @ full wall area	3.10 @ full wall area	--
Floors-on-ground; Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)	1.50 @ full floor area	1.08 @ full floor area	--
Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.08 @ perimeter	1.08 @ perimeter	--

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	required	required	--

# ALBERTA

## 1997 Alberta Building Code

**Table 9.25.2.1.9**  
**Thermal Insulation Requirements**  
 Forming Part of Sentence 9.25.2.1.(2)

Location of Assembly in Which Insulation is Placed		Minimum Thermal Resistance m <sup>2</sup> ·°C/W
Wall assembly (except basements)	Building exterior	2.1
	Between building and attached garage	2.1
	Exterior of heated garage	2.1
Basement and crawl space	Perimeter walls – top to 600 mm below grade	1.4
Floor Assembly	Perimeter	2.1
	Exposed cantilevers	3.5
Roof – ceiling assembly	Building – general	6.0
	Heated garage	6.0

## 1997 MNECH

### Alberta - Administrative Region A

Principal Heating Source		
Electricity, Other	Propane, Oil, Heat Pump	Nat. Gas

Table 3.3.1.1. Forming Part of Sentence 3.3.1.1.(1) <b>Above-ground Building Assemblies</b>	Minimum Effective Thermal Resistance RSI-value (m <sup>2</sup> ·°C/W)		
Roofs (see Appendix Note A-3.3.1.1.): Type I - attic-type roofs	8.80	8.80	5.80
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	5.30	5.30	5.30
Walls	4.10	4.10	3.00
Floors	5.20	4.60	4.60

Table 3.3.1.3. Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	Minimum Energy Rating ER (W/m <sup>2</sup> )		
Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.): Operable or fixed glazing with sash	-13.0	-13.0	-13.0
Fixed glazing without sash	-3.0	-3.0	-3.0
	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>·°C)</b>		

Windows and other glazed areas outside the scope of CSA Standard A440.2	2.60	2.60	2.60
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<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>·°C/W)</b>		
Walls	3.10 @ full wall area	3.10 @ full wall area	2.10 @ full wall area
Floors-on-ground: Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)	1.08 @ full floor area	1.08 @ full floor area	1.08 @ full floor area
Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.08 @ perimeter	1.08 @ perimeter	no insulation required

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	required	required	--

## Alberta - Administrative Region B

<b>Principal Heating Source</b>		
Electricity, Other	Propane, Oil, Heat Pump	Nat. Gas

<b>Table 3.3.1.1.</b> Forming Part of Sentence 3.3.1.1.(1) <b>Above-ground Building Assemblies</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>·°C/W)</b>		
Roofs (see Appendix Note A-3.3.1.1.): Type I - attic-type roofs	8.80	8.80	5.80
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	5.30	5.30	5.30
Walls	4.10	4.10	3.00
Floors	5.20	5.20	4.60

<b>Table 3.3.1.3.</b> Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	<b>Minimum Energy Rating ER (W/m<sup>2</sup>)</b>		
Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.): Operable or fixed glazing with sash	-10.0	-13.0	-13.0
Fixed glazing without sash	0.0	-3.0	-3.0
	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>·°C)</b>		
Windows and other glazed areas outside the scope of CSA Standard A440.2	2.40	2.60	2.60

<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Walls	3.10 @ full wall area	3.10 @ full wall area	2.10 @ full wall area
Floors-on-ground: Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)	1.50 @ full floor area	1.08 @ full floor area	1.08 @ full floor area
Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.08 @ perimeter	1.08 @ perimeter	1.08 @ perimeter

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	required	required	--

## Alberta - Administrative Region C

<b>Principal Heating Source</b>		
Electricity, Other	Propane, Oil, Heat Pump	Nat. Gas

<b>Table 3.3.1.1.</b> Forming Part of Sentence 3.3.1.1.(1) <b>Above-ground Building Assemblies</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Roofs (see Appendix Note A-3.3.1.1.): Type I - attic-type roofs	10.60	8.80	5.80
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	5.30	5.30	5.30
Walls	4.10	4.10	3.00
Floors	5.20	5.20	4.60

<b>Table 3.3.1.3.</b> Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	<b>Minimum Energy Rating ER (W/m<sup>2</sup>)</b>		
Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.): Operable or fixed glazing with sash	-10.0	-13.0	-13.0
Fixed glazing without sash	0.0	-3.0	-3.0
	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>•°C)</b>		
Windows and other glazed areas outside the scope of CSA Standard A440.2	2.40	2.60	2.60

<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>·°C/W)</b>		
Walls	3.10 @ full wall area	3.10 @ full wall area	2.10 @ full wall area
Floors-on-ground: Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)  Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.50 @ full floor area  1.08 @ perimeter	1.08 @ full floor area  1.08 @ perimeter	1.08 @ full floor area  1.08 @ perimeter

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	required	required	--

# BRITISH COLUMBIA

1998 BCBC

**Table 9.25.2.1.**  
**Minimum Thermal Resistance of Insulation RSI, m<sup>2</sup>·°C/W for Buildings of Residential Occupancy**  
 Forming Part of Article 9.25.1.1.

Building Assembly	Value Required	
	Less than 4500 Celsius Degree Days	4500 and Greater Celsius Degree Days
Attic Spaces	7.0	7.7
Roof Joist Assemblies (Cathedral Ceilings/Flat Roofs)	4.9	4.9
Frame Walls (including frame crawl space walls)	3.5	3.85
Suspended Floors (Framed)	4.9	4.9
(Concrete Slab)	2.1	2.1
Foundation Walls (insulation to 600 mm below grade)	2.1	2.1
Unheated Concrete Slabs on Ground at or above grade (insulation around edge of slab and 500 mm vertical on horizontal from bottom edge of slab)	1.8	2.1
Radiant Heating Slabs on Ground (insulation under all slab area and around edge of slab)	2.1	2.1
Radiant Heating Suspended Floor Assembly Over Heated Area (insulation between heated floor and heated area below)	2.1	2.1

1997 MNECH

## British Columbia - Administrative Region A

Principal Heating Source		
Nat. Gas	Electricity, Oil, Propane Heat Pump , Other	--

Table 3.3.1.1. Forming Part of Sentence 3.3.1.1.(1) Above-ground Building Assemblies	Minimum Effective Thermal Resistance RSI-value (m <sup>2</sup> ·°C/W)		
Roofs (see Appendix Note A-3.3.1.1.): Type I - attic-type roofs	5.40	7.00	--
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	4.30	4.30	--
Walls	2.00	3.10	--
Floors: Type I - all floors except concrete slab type	4.80	4.80	--
Type II - concrete slab type	2.10	2.10	--

<b>Table 3.3.1.3.</b> Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	<b>Minimum Energy Rating ER (W/m<sup>2</sup>)</b>		
Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.):			
Operable or fixed glazing with sash	-24.0	-24.0	--
Fixed glazing without sash	-15.0	-15.0	--
	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>•°C)</b>		
Windows and other glazed areas outside the scope of CSA Standard A440.2	3.20	3.20	--

<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Walls	1.70 @ 600 mm below ground	2.10 @ 600 mm below ground	--
Floors-on-ground: Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)	1.50 @ full floor area	1.90 @ full floor area	--
Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.08 @ perimeter for 600 mm	1.08 @ perimeter for 600 mm	--

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	--	required	--

## British Columbia - Administrative Region B

<b>Principal Heating Source</b>		
Nat. Gas	Electricity, Oil, Propane Heat Pump , Other	--

<b>Table 3.3.1.1.</b> Forming Part of Sentence 3.3.1.1.(1) <b>Above-ground Building Assemblies</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Roofs (see Appendix Note A-3.3.1.1.):			
Type I - attic-type roofs	5.90	7.00	--
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	4.30	4.30	--
Walls	2.90	3.10	--
Floors:			
Type I - all floors except concrete slab type	4.80	4.80	--
Type II - concrete slab type	2.10	2.10	--

<b>Table 3.3.1.3.</b> Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	<b>Minimum Energy Rating ER (W/m<sup>2</sup>)</b>		
Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.):			
Operable or fixed glazing with sash	-24.0	-24.0	--
Fixed glazing without sash	-15.0	-15.0	--
	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>·°C)</b>		
Windows and other glazed areas outside the scope of CSA Standard A440.2	3.20	3.20	--

<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>·°C/W)</b>		
Walls	2.10 @ 600 mm below ground	2.10 @ full wall area, or 2.64 @ 600 mm below ground	--
Floors-on-ground:			
Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)	1.08 @ full floor area	1.50 @ full floor area	--
Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.08 @ perimeter for 600 mm	1.08 @ perimeter for 600 mm	--

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	--	required	--

## British Columbia - Administrative Region C

<b>Principal Heating Source</b>		
Nat. Gas	Electricity, Oil, Propane Heat Pump, Other	--

<b>Table 3.3.1.1.</b> Forming Part of Sentence 3.3.1.1.(1) <b>Above-ground Building Assemblies</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>·°C/W)</b>		
Roofs (see Appendix Note A-3.3.1.1.):			
Type I - attic-type roofs	5.90	7.00	--
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	4.30	4.30	--
Walls	2.90	3.10	--
Floors:			
Type I - all floors except concrete slab type	4.80	4.80	--
Type II - concrete slab type	2.10	2.10	--

<b>Table 3.3.1.3.</b> Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	<b>Minimum Energy Rating ER (W/m<sup>2</sup>)</b>		
Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.): Operable or fixed glazing with sash	-24.0	-24.0	--
Fixed glazing without sash	-15.0	-15.0	--
	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>•°C)</b>		
Windows and other glazed areas outside the scope of CSA Standard A440.2	3.20	3.20	--

<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Walls	1.70 @ 600 mm below ground	2.10 @ 600 mm below ground	--
Floors-on-ground; Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)	1.50 @ full floor area	1.90 @ full floor area	--
Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.08 @ perimeter for 600 mm	1.08 @ perimeter for 600 mm	--

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	--	required	--

## British Columbia - Administrative Region D

<b>Principal Heating Source</b>		
Nat. Gas	Electricity, Oil, Propane Heat Pump, Other	--

<b>Table 3.3.1.1.</b> Forming Part of Sentence 3.3.1.1.(1) <b>Above-ground Building Assemblies</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Roofs (see Appendix Note A-3.3.1.1.): Type I - attic-type roofs	5.90	7.00	--
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	4.30	4.30	--
Walls	2.90	3.10	--
Floors: Type I - all floors except concrete slab type	4.80	4.80	--
Type II - concrete slab type	2.10	2.10	--

<b>Table 3.3.1.3.</b> Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	<b>Minimum Energy Rating ER (W/m<sup>2</sup>)</b>		
Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.): Operable or fixed glazing with sash	-24.0	-24.0	--
Fixed glazing without sash	-15.0	-15.0	--
	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>•°C)</b>		
Windows and other glazed areas outside the scope of CSA Standard A440.2	3.20	3.20	--

<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Walls	1.70 @ 600 mm below ground	2.10 @ 600 mm below ground	--
Floors-on-ground; Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)	1.08 @ full floor area	1.50 @ full floor area	--
Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.08 @ perimeter for 600 mm	1.08 @ perimeter for 600 mm	--

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	--	required	--

## British Columbia - Administrative Region E

<b>Principal Heating Source</b>		
Nat. Gas	Electricity, Oil, Propane Heat Pump, Other	--

<b>Table 3.3.1.1.</b> Forming Part of Sentence 3.3.1.1.(1) <b>Above-ground Building Assemblies</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>•°C/W)</b>		
Roofs (see Appendix Note A-3.3.1.1.): Type I - attic-type roofs	5.90	7.00	--
Type II - all other roofs (e.g., sawn lumber joists, parallel-chord trusses and wood I-joists)	4.30	4.30	--
Walls	2.90	3.10	--
Floors: Type I - all floors except concrete slab type	4.80	4.80	--
Type II - concrete slab type	2.10	2.10	--

<b>Table 3.3.1.3.</b> Forming Part of Sentences 3.3.1.3.(1) and 3.3.1.3.(2) <b>Windows and Other Glazed Areas</b>	<b>Minimum Energy Rating ER (W/m<sup>2</sup>)</b>		
	Windows and sliding glass doors within the scope of CSA Standard A440.2 (see Appendix Note A-3.3.1.3.): Operable or fixed glazing with sash Fixed glazing without sash	-24.0	-24.0
	-15.0	-15.0	--
	<b>Maximum Overall Thermal Transmittance U-value (W/m<sup>2</sup>·°C)</b>		
Windows and other glazed areas outside the scope of CSA Standard A440.2	3.20	3.20	--

<b>Table 3.3.2.1.</b> Forming Part of Sentences 3.3.2.1.(1) and (3) and 3.3.2.2.(1) and (2) <b>Building Assemblies in Contact with the Ground</b>	<b>Minimum Effective Thermal Resistance RSI-value (m<sup>2</sup>·°C/W)</b>		
	Walls	1.70 @ 600 mm below ground	2.10 @ 600 mm below ground
Floors-on-ground; Type I - with imbedded heating ducts, cables or pipes (e.g., radiant heating slabs)	1.08 @ full floor area	1.50 @ full floor area	--
Type II - other floors-on-ground less than 0.6 m below grade (e.g., concrete slab with rigid insulation)	1.08 @ perimeter for 600 mm	1.08 @ perimeter for 600 mm	--

<b>Table 5.3.1.1.A.</b> Forming Part of Sentence 5.3.1.1.(1) <b>Heat Recovery</b>			
Heat recovery on principal exhaust component of the mechanical ventilation system in dwelling units	--	required	--