

## ELECTRIC GENERAL RATE APPLICATION 2015

### Informal Manitoba Hydro Undertaking #8

**Manitoba Hydro to provide the PUB with the current code requirements in Manitoba identifying where there are differences between regions.**

### Response:

Although codes pertaining to energy efficiency cover all aspects of a building including the equipment that is used to heat and cool the building, the only aspect that varies by region within Manitoba would be building envelope measures (insulation and windows).

Table 1 outlines the requirements for Part 9 residential construction that are in force today. A home built North of the 53<sup>rd</sup> parallel would required R25 insulation in walls built above grade versus a home South of the 53<sup>rd</sup> parallel which would require R20. The requirements for windows are the same throughout the province.

Table 1: Adapted from Manitoba Building Code (Regulation 31/2011)

**Table 9.25.6.2.  
Minimum Thermal Resistance for the Building Envelope  
Forming Part of Article 9.25.6.2.**

<b>Building Assembly</b>	<b>Southern Manitoba<sup>(1)</sup></b>	<b>Northern Manitoba<sup>(2)</sup></b>
Interior and Exterior Foundation Walls <sup>(3) (4)</sup>	RSI-3.5 (R-20) or RSI-2.1 (R-12) on the inside wall with RSI-0.88 (R-5) on the outside wall	RSI-3.5 (R-20) or RSI-2.1 (R-12) on the inside wall with RSI-0.88 (R-5) on the outside wall
Floors on Heated Ground	RSI-0.88 (R-5) Full Area	RSI-0.88 (R-5) Full Area
Floors on Unheated Ground (less than 0.6 m below <i>grade</i> )	RSI-0.88(R-5) 1 m Perimeter	RSI-0.88(R-5) 1 m Perimeter
Floors on Unheated Ground (0.6m or more below <i>grade</i> )	No Requirement	No Requirement
Floors Above Unheated Spaces	RSI-4.9 (R-28)	RSI-4.9 (R-28)
Walls Above <i>Grade</i>	RSI-3.5 (R-20)	RSI-4.4 (R-25)
Roofs ( <i>Attics</i> )	RSI-8.8 (R-50)	RSI-8.8 (R-50)
Roofs (Sloped Ceilings)	RSI-4.9 (R-28)	RSI-4.9 (R-28)

**Notes to Table 9.25.6.2.:**

- <sup>1</sup> South of the 53rd Parallel.
- <sup>2</sup> On or north of the 53rd Parallel.
- <sup>3</sup> See Sentence 9.25.6.3.(1) for minimum depth of insulation below *grade*.
- <sup>4</sup> See Sentence 9.25.6.4.(1) for *foundation* walls that extend more than 1.2 m above ground level.

On April 27, 2015 the Provincial government approved further changes to the Manitoba Building Code that were recommended as a result of the overall review of the new Section 9.36, pertaining specifically to energy efficiency in residential and small commercial buildings, of the National Building Code of Canada (NBC).

Tables 2a and 2b outlines the most recently approved amendments. Note that the requirements for insulation have remained largely the same but have been changed from nominal R-values to effective R-values. Nominal R-values are the rated or labeled values of insulation products. Nominal R-values do not consider the effectiveness of the insulation when it is combined with framing members and other conventional building materials. Effective R-values are the total resistance to heat transfer that is provided by all components in a wall assembly including framing material. These amendments also align the zone treatment with that of the national code (See Figure 1).

Table 2a: Adapted from Manitoba Building Code, amendment (Regulation 52/2015)

**Table 9.36.2.6B.**  
**Effective Thermal Resistance of Above-ground Opaque Assemblies in**  
**Buildings with a Heat-Recovery Ventilator**  
Forming Part of Sentence 9.36.2.6(1)

Above-ground Opaque <i>Building</i> Assembly	Heating Degree-Days of <i>Building</i> Location, <sup>(1)</sup> in Celsius Degree-Days		
	Zone 7A 5000 to 5999	Zone 7B 6000 to 6999	Zone 8 >7000
	Minimum Effective Thermal Resistance (RSI), (m <sup>2</sup> ·K)/W (Effective R values in ft <sup>2</sup> ·°F·h/Btu)		
Ceilings below attics	8.50 (R48.3)	8.50 (R48.3)	8.50 (R48.3)
Cathedral ceilings and flat roofs	5.02 (R28.5)	5.02 (R28.5)	5.02 (R28.5)
Walls <sup>(2),(3)</sup>	2.80 (R15.9)	2.80 (R15.9)	3.08 (R17.5)
Floors over unheated spaces	5.02 (R28.5)	5.02 (R28.5)	5.02 (R28.5)

Notes to Table 9.36.2.6B.:

- <sup>(1)</sup> See Article 1.1.3.1.
- <sup>(2)</sup> See Sentence 9.36.2.8.(3) for requirements concerning the above-ground portion of *foundation* walls.
- <sup>(3)</sup> Walls exceeding the maximum unsupported height listed in Table 9.23.10.1. are permitted to have a RSI (R-value) of 0.03 (R0.17) lower than indicated.

Table 2b: Adapted from Manitoba Building Code, amendment (Regulation 52/2015)

**Table 9.36.2.8.B.**  
**Effective Thermal Resistance of Assemblies Below-Grade or in Contact with the**  
**Ground in Buildings with a Heat-Recovery Ventilator**  
Forming Part of Sentences 9.36.2.8(1) to (9)

Building Assembly Below-Grade or in Contact with the Ground <sup>(1)</sup>	Heating Degree-Days of <i>Building</i> Location, <sup>(2)</sup> in Celsius Degree-Days		
	Zone 7A 5000 to 5999	Zone 7B 6000 to 6999	Zone 8 ≥7000
	Minimum Effective Thermal Resistance (RSI), (m <sup>2</sup> ·K)/W (Effective R values in ft <sup>2</sup> ·°F·h/Btu)		
Foundation Walls	2.80 (R15.9)	2.80 (R15.9)	2.80 (R15.9)
Unheated floors <sup>(3)</sup>			
below frost line <sup>(4)(5)</sup>	uninsulated	uninsulated	uninsulated
above frost line <sup>(5)</sup>	1.96 (R11.1)	1.96 (R11.1)	1.96 (R11.1)
Heated and unheated floors on permafrost	n/a	4.44 (R25.2)	4.44 (R25.2)
Heated floors <sup>(6)</sup>	2.84 (R16.1)	2.84 (R16.1)	2.84 (R16.1)
Slabs-on-grade with an integral footing <sup>(6)</sup>	2.84 (R16.1)	2.84 (R16.1)	3.72 (R21.1)

Notes to Table 9.36.2.8B.:

<sup>(1)</sup> See Appendix A.

<sup>(2)</sup> See Article 1.1.3.1

<sup>(3)</sup> Does not apply to below-grade floors over heated crawl spaces.

<sup>(4)</sup> Typically applies to floors-on-ground in full-height *basements*.

<sup>(5)</sup> Refers to undisturbed frost line before house is constructed.

<sup>(6)</sup> See Sentence 9.25.2.3.(5) for requirement on placement of insulation. The design of slabs-on-grade with an integral foot is addressed in Part 4 (see Article 9.6.1.2.).

Tables 2c and 2d were changes made to the NBC and adopted without changes in Manitoba with slightly higher requirements for skylights, windows, and doors for zones 7b and 8. These changes also come into effect on April 1, 2016.

Table 2c: Adapted from 2010 National Building Code of Canada – Revisions and Errata Package – Section 9.36. Energy Efficiency

**Table 9.36.2.7.B.**  
**Overall Thermal Transmittance of Skylights**  
Forming Part of Sentence 9.36.2.7.(2)

Component	Heating Degree-Days of <i>Building</i> Location, <sup>(1)</sup> in Celsius Degree-Days					
	Zone 4 < 3000	Zone 5 3000 to 3999	Zone 6 4000 to 4999	Zone 7A 5000 to 5999	Zone 7B 6000 to 6999	Zone 8 ≥ 7000
	Maximum Overall Thermal Transmittance, W/(m <sup>2</sup> ·K)					
Skylights	2.90	2.90	2.70	2.70	2.40	2.40

**Notes to Table 9.36.2.7.B.:**

<sup>(1)</sup> See Article 1.1.3.1.

Table 2d: Adapted from 2010 National Building Code of Canada – Revisions and Errata Package – Section 9.36. Energy Efficiency

**Table 9.36.2.7.A.**  
**Required Thermal Characteristics of Fenestration and Doors**  
Forming Part of Sentence 9.36.2.7.(1)

Components	Thermal Characteristics <sup>(1)</sup>	Heating Degree-Days of <i>Building</i> Location, <sup>(2)</sup> in Celsius Degree-Days					
		Zone 4 < 3000	Zone 5 3000 to 3999	Zone 6 4000 to 4999	Zone 7A 5000 to 5999	Zone 7B 6000 to 6999	Zone 8 ≥ 7000
Fenestration <sup>(3)</sup> and doors	Max. U-value, W/(m <sup>2</sup> ·K)	1.80	1.80	1.60	1.60	1.40	1.40
	Min. Energy Rating	21	21	25	25	29	29

Figure 1: Adapted from 2011 National Energy Code of Canada for Buildings



Figure 1a: Selection of Manitoba Communities by Zone

City/Town	HDD	Zone
Beausejour	5680	7a
Boissevain	5500	7a
Brandon	5760	7a
Churchill	8950	8
Dauphin	5900	7a
Flin Flon	6440	7b
Gimli	5800	7a
Island Lake	6900	7b
Lynn Lake	7770	8
Morden	5400	7a
Neepawa	5760	7a
Pine Falls	5900	7a
Portage La Prairie	5600	7a
Selkirk	5700	7a
Split Lake	7900	8
Steinbach	5700	7a
Swan River	6100	7b

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The Pas	6480	7b
Thompson	7600	8
Virden	5620	7a
Winnipeg	5670	7a