

## **CHANGES TO THE BC BUILDING CODE, EFFECTIVE SEPTEMBER 5, 2008**

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### **SUMMARY OF CHANGES**

- A new Part 10 has been added to the Building Code that reflects the two new added objectives of water and energy efficiency.
- The Part 9 thermal insulation table has been relocated to Part 10 and its scope expanded to include four storey (in building height) residential buildings. The table has further been amended by:
  1. eliminating the allowance to use R14 instead of R20 insulation for natural gas-heated buildings in the Lower Mainland, and
  2. increasing the attic space insulation from RSI 7.7 to RSI 9.0 in the colder areas of the province (4500 and greater degree days).
- Achievement of an EnerGuide Rating System rating of 77 is an acceptable solution that provides an alternative to compliance with the insulation table for residential buildings.
- Non-residential Part 9 buildings must now provide thermal insulation in wall, roof and suspended floor assemblies. The amount of insulation is derived from ASHRAE 90.1-2004.
- All other buildings (primarily Part 3) must comply with the ASHRAE 90.1-2004 standard.
- The requirements of the existing Water Conservation Plumbing Regulation have been relocated to Part 10 of the Building Code and are now applicable province-wide.

## TEXT OF CHANGES

### DIVISION A

**The following new objectives are added after OP5 Protection of the Building or Facility from Water and Sewage Damage:**

#### **OE Energy and Water Efficiency**

An objective of this Code is to limit the probability that, as a result of design, construction or renovation of a *building*, the use of energy or water will be unacceptably inefficient or the production of greenhouse gases will be unacceptably excessive.

##### **OE1 Energy Efficiency**

An objective of this Code is to limit the probability that, as a result of design, construction or renovation of a *building*, the use of energy will be unacceptably inefficient or the production of greenhouse gases will be unacceptably excessive. The unacceptable risks of inefficient energy use or excessive greenhouse gas production addressed by this Code are those caused by –

OE 1.1 – inefficient energy performance of *buildings* or *building* components

##### **OE2 Water Efficiency**

An objective of this Code is to limit the probability that, as a result of design, construction or renovation of a *building* the use of water will be unacceptably inefficient. The unacceptable risks of inefficient water addressed by this Code are those caused by –

OE 2.1 – inefficient plumbing *fixtures*

OE 2.2 – inefficient *water distribution system*

**The following new functional statements are added after F82:**

F83 To control the amount of water a plumbing *fixture* will use.

F84 To control the flow of water to a plumbing *fixture* or outlet.

F85 To minimize thermal loss or gain.

F86 To minimize the use of energy for *building* systems.

## DIVISION B

The following document is referenced in Table 1.3.1.2. after ANSI/ASHRAE 62-2001 Ventilation for Acceptable Indoor Air Quality:

ANSI/ASHRAE/IESNA	90.1-2004	Energy Standard for Buildings Except Low-Rise Residential Buildings	10.2.1.1.1.(1) Table 10.2.1.1.B
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In Section 9.25.2. Thermal Insulation, Sentence 9.25.2.1.(1) is replaced by:

1) All walls, ceilings and floors separating heated space from unheated space, the exterior air or the exterior *soil* shall be provided with sufficient thermal insulation to prevent moisture condensation on their room side during the winter and to ensure comfortable conditions for the occupants. (See A-9.1.1.1.(1) in Appendix A.) (See Part 10)

Table 9.25.2.1. is deleted.

Sentence 9.25.2.3.(9). Is deleted.

The following new Part 10 is inserted after the end of Part 9:

## Part 10 – Energy and Water Efficiency

### Section 10.1. General

#### 10.1.1.Application

##### 10.1.1.1.Scope

1) The scope of this Part shall be as described in Subsection 1.3.3. of Division A.

#### 10.1.2.Definitions

##### 10.1.2.1.Defined Terms

1) Words that appear in italics are defined in Article 1.4.1.2. of Division A.

## Section 10.2. Energy Efficiency

### 10.2.1. Design and Installation

#### 10.2.1.1. Design

- 1) Except as provided for in Sentences (2) or (4), all *buildings* shall be designed to conform with ANSI/ASHRAE/IESNA 90.1, “Energy Standard for Buildings Except Low-Rise Residential Buildings”.
- 2) Except as permitted in Sentence (3), those parts of *buildings* of *residential major occupancy* in *buildings* of less than 5 *storeys* in *building height* shall be provided with thermal insulation between heated and unheated space, the exterior air or the exterior *soil*, and heating floor assemblies and heated areas below in conformance to Table 10.2.1.1. A.
- 3) Alternatives to the requirements of Table 10.2.1.1.A may be determined through
  - a) the use of energy computer modeling resulting in an equivalent performance to the prescribed requirements in Table 10.2.1.1.A, (See Appendix A), or
  - b) achieving an EnerGuide Rating System rating of 77, verified by an EnerGuide Rating System energy advisor licensed by Natural Resources Canada to evaluate the energy efficiency of new houses.
- 4) *Buildings* or parts of *buildings* described in Sentence 1.3.3.3.(1), Division A, of other than *residential major occupancy*, shall be provided with thermal insulation between heated and unheated space, the exterior air or the exterior *soil* in conformance to Table 10.2.1.1.B.
- 5) Insulation and the installation of insulation shall conform to
  - a) Subsection 9.25.2., or
  - b) Part 5

**Table 10.2.1.1. A.**  
**Minimum Thermal Resistance of Insulation RSI, m<sup>2</sup>C/W for**  
**Buildings of Residential Occupancy less than 5 Storeys in Building Height**  
 Forming Part of Sentence 10.2.1.1.(2)

<b>Building Assembly</b>	<b>Value Required</b>		
	<b>Less than 3500 Degree Days</b>	<b>3500 Degree to 4500 Degree Days</b>	<b>More than 4500 Degree Days</b>
Attic Space(1)	7.0	7.7	9.0
Roof Joist Assemblies (Cathedral Ceilings/Flat Roofs)	4.9	4.9	4.9
Frame Walls(2) (including frame crawl space walls)	3.5	3.5	3.85
Suspended Floors (framed)	4.9	4.9	4.9
Suspended Floors (concrete slab)	2.1	2.1	2.1
Foundation Walls (insulation to 600 mm below grade)	2.1	2.1	2.1
Unheated Concrete Slabs on Ground at or above grade (insulation around edge of slab(3) and 500mm vertical or horizontal from bottom edge of slab)	1.8	2.1	2.1
Radiant Heating Slabs on Ground (insulation under all slab area and around edge of slab)	2.1	2.1	2.1
Radiant Heating Suspended Floor Assembly Over Heated Area (insulation between heated floor and heated area below) (4)	2.1	2.1	2.1

(1) The thermal resistance rating of attic space insulation may be reduced to the minimum value for framed walls for a distance of

(a) 1.0 m from the exterior wall in *buildings* where the thermal resistance rating of the wall below is not required to exceed 3.5 or

(b) 1.5 m from the exterior wall in *buildings* where the thermal resistance rating of the wall below is not required to exceed 3.85.

(2) Stud/Frame type wall construction. This is not intended to apply to masonry, log or construction without a cavity.

(3) The top edge of insulation between the slab edge and foundation wall may be protected with a pressure treated preserved wood filler strip not more than 50 mm thick.

(4) Not applicable when heating elements or piping are located within a concrete topping on a suspended floor assembly or within an internally heated suspended slab.

<p align="center"><b>Table 10.2.1.1.B.</b></p> <p align="center"><b>Minimum Thermal Resistance of Insulation RSI, m<sup>2</sup>C/W for</b></p> <p align="center"><b><i>Buildings of other than Residential Occupancy</i> as described in Sentence 1.3.3.3(1)</b></p> <p align="center"><b>Division A</b></p> <p align="center">(Derived from ANSI/ASHRAE/IESNA Standard 90.1)</p>						
<b>Building Assembly</b>	<b>Value Required</b>		<b>Value Required</b>		<b>Value Required</b>	
	<b>Less than 4000 Degree Days</b>		<b>4000 to 5000 Degree Days</b>		<b>Greater than 5000 Degree Days</b>	
	Heated	Semi heated (1)	Heated	Semi heated (1)	Heated	Semi heated (1)
<b>Roof Insulation</b>						
Above deck	2.6 ci	0.9 ci	2.6 ci	0.9 ci	2.6 ci	0.9 ci
Metal building (2)	3.3	1.8	3.3	1.8	3.3	1.8
Attic or other	5.3	3.3	6.7	3.3	6.7	3.3
<b>Walls, Above Ground</b>						
Mass	1.3 ci	-	1.7 ci	-	2.0 ci	-
Metal building (2)	2.3	1.9	2.3	2.3	2.3 + 2.3 (3)	2.3
Steel Framed (4)	2.3 + 0.7 ci	2.3	2.3 + 0.7 ci	2.3	2.3 + 1.3 ci	2.3
Wood Frame or other	2.3	2.3	2.3	2.3	2.3	2.3
<b>Suspended Floors</b>						
Framed	5.3	2.3	5.3	2.3	5.3	3.3
Concrete slab	1.5	-	1.5	-	1.5	0.7 ci

**Notes**

- ci continuous insulation: insulation that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior, exterior or is integral to any opaque surface of the *building* envelope.
- <sup>(1)</sup> Semiheated space is an enclosed space within a *building* that is heated by a heating system greater or equal to 10W/m<sup>2</sup> of floor area but does not exceed:
  - a) 45 W/m<sup>2</sup> of floor area in locations of less than 4000 degree days, or
  - b) 60 W/m<sup>2</sup> of floor area in locations of 4000 or greater degree days
- <sup>(2)</sup> a *building* constructed primarily of a steel framed superstructure and metal skin
- <sup>(3)</sup> the first rated R-value is the insulation compressed between metal wall panels and the steel structure  
the second rated R-value is for insulation installed from the inside, covering the girts
- <sup>(4)</sup> a wall with a cavity (insulated or otherwise) whose exterior surfaces are separated by steel framing members (i.e. typical steel stud walls and curtain wall systems.)

## Section 10.3. Water Efficiency

### 10.3.1. Design and Installation

#### 10.3.1.1. Fixture Fitting Maximum Flow Rates

- 1) The flow rates of fittings that supply water to plumbing *fixtures* must not exceed the maximum flow rate at the test pressures listed for that fitting in Table 10.3.1.1.

<b>Table 10.3.1.1.</b> <b>Maximum Flow Rates for Supply Fittings</b> Forming Part of Sentence 10.3.1.1.(1)		
<b>Fittings</b>	<b>Maximum Flow (L/min)</b>	<b>Test Pressure (kPa)</b>
Lavatory Faucet	8.3	415
Kitchen Faucet	8.3	415
Shower Head	9.5	550

#### 10.3.1.2. Fixture Efficiency

- 1) The flush cycle for the installation of a water closet or urinal must not exceed the flush cycle listed for that fixture in Table 10.3.1.2.

<b>Table 10.3.1.2.</b> <b>Maximum Flush Cycle</b> Forming Part of Sentence 10.3.1.2.(1)	
<b>Fixture</b>	<b>Litres</b>
Water Closet (Tank Type)	6.0
Water Closet (Direct Flush)	6.0
Urinal (Tank Type) Urinal (Direct Flush)	5.7
	5.7

- 2) The water supply to urinal flush tanks equipped for automatic flushing shall be controlled with a timing device in order to limit operation to the period during which the *building* is normally occupied.

## Section 10.4. Objectives and Functional Statements

### 10.4.1. Objectives and Functional Statements

#### 10.4.1.1. Attribution to Acceptable Solutions

- 1) For the purposes of compliance with this Code as required in Clause 1.2.1.1.(1)(b) of Division A, the objectives and functional statements attributed to the acceptable solutions in this Part shall be the objectives and functional statements listed in Table 10.4.1.1. (See A-1.1.2.1.(1) in Appendix A)

<b>Table 10.4.1.1.</b> <b>Objectives and Functional Statements Attributed to the</b> <b>Acceptable Solutions in Part 9</b> Forming Part of Sentence 10.4.1.1.(1)	
<b>Acceptable Solutions</b>	<b>Objectives and Functional Statements</b>
<b>10.2.1.1. Design</b>	
(1)	[F85-OE1] [F86-OE1]
(2)	[F85-OE1]
(3)	[F85-OE1]
(4)	[F85-OE1]
(5)	[F85-OE1]
<b>10.3.1.1 Design and Installation</b>	
(1)	[F84-OE2]
<b>10.3.1.2. Fixture Efficiency</b>	
(1)	[F83-OE2]
(2)	[F83-OE2]

The following new appendix note is inserted after appendix note A-9.36.2.21:

### **DIVISION B, APPENDIX A, PART 10**

**A-10.2.1.1.(3) Alternatives to Prescribed Insulation Requirements** Computer modelling can provide options to the requirements of Table 10.2.1.1.A by considering factors other than insulation that impact energy efficiency and greenhouse gas emissions. These include items such as higher fenestration efficiency, more efficient Heating, Ventilating, Air Conditioning (HVAC) systems, renewable energy systems and reduced envelope air leakage from what is required or is common practice.

The Natural Resources Canada EnerGuide Rating System program uses Hot2000 Version 10 for modelling. It can be downloaded at: [http://www.sbc.nrcan.gc.ca/software\\_and\\_tools/hot2000\\_e.asp](http://www.sbc.nrcan.gc.ca/software_and_tools/hot2000_e.asp)

The Ministry of Energy, Mines and Petroleum Resources can provide assistance in determining options to the prescriptive insulation requirements of Table 10.2.1.1.A.