

PROVINCE OF BRITISH COLUMBIA

ORDER OF THE MINISTER OF
MUNICIPAL AFFAIRS AND HOUSING

Building Act

Ministerial Order No. BA 2018 2

I, Selina Robinson, Minister of Municipal Affairs and Housing, order that immediately after the British Columbia Building Code Order, Ministerial Order No. BA 2018 1 (the “Order”) becoming effective on December 10, 2018, the Order is amended as set out in the attached Schedule.

November 30, 2018

Date



Minister of Municipal Affairs and Housing

(This part is for administrative purposes only and is not part of the Order.)

Authority under which Order is made:

Act and section: Building Act, S.B.C. 2015, c. 2, s.3

Other: MO BA 2018 1

Schedule

1 Book I (General) of the British Columbia Building Code established by the British Columbia Building Code Order, Ministerial Order No. BA 2018 1, is amended as set out in this Schedule.

Changes to Division B - Part 1

2 Table 1.3.1.2. of Division B is amended

(a) by adding the following items:

<u>ASHRAE</u>	<u>ANSI/ASHRAE/IES 90.1</u>	<u>Energy Standard for Buildings Except Low-Rise Residential Buildings</u>	<u>10.2.2.2.(1)</u> <u>A-10.2.2.2.</u>
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<u>CCBFC</u>	<u>NRCC</u>	<u>National Energy Code of Canada for Buildings</u>	<u>10.2.2.2.(2)</u> <u>A-10.2.2.2.</u>
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and

(b) by repealing the following item:

ASHRAE	ANSI/ASHRAE 90.1-2016	Energy Standard for Buildings Except Low-Rise Residential Buildings	10.2.2.1.(1)
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and substituting the following:

ASHRAE	ANSI/ASHRAE/IES 90.1-2016	Energy Standard for Buildings Except Low-Rise Residential Buildings (except Subsection 8.4.2.)	10.2.2.1.(1) <u>A-10.2.2.2.</u>
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and

(c) by repealing the following item:

CCBFC	NRCC 56191	National Energy Code of Canada for Buildings 2015	A-2.1.1.2.(6) ⁽⁴⁾ A-2.2.1.1.(1) ⁽⁴⁾ A-3.2.1.1.(1) ⁽⁴⁾ Table 3.10.1.1.(1) 9.36.1.3.(1) 9.36.1.3.(4) 9.36.3.1.(2) 9.36.4.1.(2) 10.2.2.1.(1) Table 10.2.3.3.-A Table 10.2.3.3.-B 10.2.3.4.(1) A-9.36.1.3. A-9.36.2.4.(1) A-9.36.3.10.(1) A-9.36.4.2.(1) A-9.36.5.2. A-10.2.3.3.(2) A-10.2.3.4.(1) A-10.2.3.4.(2) A-10.2.3.4.(3) A-2.2.8.1.(1) ⁽⁵⁾
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and substituting the following:

CCBFC	NRCC 56191	National Energy Code of Canada for Buildings 2015	A-2.1.1.2.(6) ⁽⁴⁾ A-2.2.1.1.(1) ⁽⁴⁾ A-3.2.1.1.(1) ⁽⁴⁾ Table 3.10.1.1.(1) 9.36.1.3.(1) 9.36.1.3.(4) 9.36.3.1.(2) 9.36.4.1.(2) A-9.36.1.3. A-9.36.2.4.(1) A-9.36.3.10.(1) A-9.36.4.2.(1) A-9.36.5.2. 10.2.2.1.(1) <u>10.2.2.2.(2)</u> <u>10.2.2.2.(3)</u> <u>10.2.2.2.(4)</u> Table 10.2.3.3.-A Table 10.2.3.3.-B 10.2.3.4.(1) <u>10.2.3.4.(4)</u> <u>A-10.2.2.2.</u> A-10.2.3.3.(2) <u>A-10.2.3.4.</u> A-2.2.8.1.(1) ⁽⁵⁾
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and

(d) by repealing the following item:

CoV	2017	City of Vancouver Energy Modelling Guidelines	10.2.3.4.(1)
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and substituting the following:

CoV	<u>Version 2.0</u>	City of Vancouver Energy Modelling Guidelines	10.2.3.4.(1) <u>10.2.3.4.(3)</u> <u>10.2.3.4.(4)</u> <u>A-10.2.3.4.</u>
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Changes to Division B - Part 9

3 Article 9.36.6.2. of Division B is repealed and the following substituted:

9.36.6.2. Definitions

(See Note A-9.36.6.2.)

1) For the purpose of this Subsection, the term “mechanical energy use intensity” shall mean a metric of the energy used over a year by the *building*, estimated by using an energy model in accordance with Article 9.36.6.4., normalized per square metre of floor area of *conditioned space* and expressed in kWh/(m²•year), for all of the following combined:

- a) space-heating equipment,

- b) space-cooling equipment,
- c) fans,
- d) service water heating equipment,
- e) pumps, and
- f) auxiliary HVAC equipment (see Note A-9.36.6.2.(1)(f)).

2) For the purpose of this Subsection, the term “EnerGuide Rating % lower than EnerGuide Reference House” shall mean the metric that results when, using HOT2000 software, version 11 or newer and Natural Resources Canada’s EnerGuide Rating System, version 15 or newer, the energy consumption of the following are compared:

- a) the proposed *building*, not including the EnerGuide assumed electric base loads, and
- b) the corresponding automatically-generated reference house, not including the EnerGuide assumed electric base loads.

3) For the purpose of this Subsection, the term “thermal energy demand intensity” shall mean a metric of the annual heating required by the *building* for space conditioning and for conditioning of ventilation air, estimated by using an energy model in accordance with Article 9.36.6.4., normalized per square metre of floor area of *conditioned space* and expressed in kWh/(m²•year), taking into account all of the following:

- a) thermal transmittance of above-ground walls and roof-ceiling assemblies,
- b) thermal transmittance of floors and walls in contact with the ground, or with space that is not *conditioned space*,
- c) thermal transmittance and solar heat gain of windows, doors and skylights,
- d) air leakage through the *air barrier system*,
- e) internal heat gains from occupants and equipment, and
- f) heat recovery from exhaust ventilation.

4) For the purpose of this Subsection, the term “Step” shall mean a Step referred to in Tables 9.36.6.3.-A to 9.36.6.3.-G.

4 Article 9.36.6.3. of Division B is repealed and the following substituted:

9.36.6.3. Compliance Requirements

1) *Buildings* conforming to the requirements of any of Steps 1 to 5 shall be designed and constructed to conform to the applicable energy performance requirements in Tables 9.36.6.3.-A to 9.36.6.3.-G.

Table 9.36.6.3.-A
Requirements for Buildings Located Where the Degree-Days Below 18°C Value is less than 3000⁽¹⁾
 Forming Part of Sentence 9.36.6.3.(1)

Step	Airtightness (Air Changes per Hour at 50 Pa Pressure Differential)	Performance Requirement of <i>Building</i> Equipment and Systems	Performance Requirement of <i>Building</i> Envelope
1	N/A	EnerGuide Rating % lower than EnerGuide Reference House: not less than 0% lower energy consumption or conform to Subsection 9.36.5.	
2	≤ 3.0	EnerGuide Rating % lower than EnerGuide Reference House: not less than 10% lower energy consumption or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	thermal energy demand intensity ≤ 35 kWh/(m ² •year)

Table 9.36.6.3.-A (continued)
Requirements for Buildings Located Where the Degree-Days Below 18°C Value is less than 3000⁽¹⁾
 Forming Part of Sentence 9.36.6.3.(1)

Step	Airtightness (Air Changes per Hour at 50 Pa Pressure Differential)	Performance Requirement of <i>Building Equipment and Systems</i>	Performance Requirement of <i>Building Envelope</i>
3	≤ 2.5	EnerGuide Rating % lower than EnerGuide Reference House: not less than 20% lower energy consumption or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	thermal energy demand intensity ≤ 30 kWh/(m ² ·year)
4	≤ 1.5	EnerGuide Rating % lower than EnerGuide Reference House: not less than 40% lower energy consumption or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	thermal energy demand intensity ≤ 20 kWh/(m ² ·year)
5	≤ 1.0	<u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	thermal energy demand intensity ≤ 15kWh/(m ² ·year)

Notes to Table 9.36.6.3.A:

(1) See Sentence 1.1.3.1.(1) and Table C-2 in Appendix C.

Table 9.36.6.3.-B
Requirements for Buildings Located Where the Degree-Days Below 18°C Value is 3000 to 3999⁽¹⁾
 Forming Part of Sentence 9.36.6.3.(1)

Step	Airtightness (Air Changes per Hour at 50 Pa Pressure Differential)	Performance Requirement of <i>Building Equipment and Systems</i>	Performance Requirement of <i>Building Envelope</i>
1	N/A	EnerGuide Rating % lower than EnerGuide Reference House: not less than 0% lower energy consumption or conform to Subsection 9.36.5.	
2	≤ 3.0	EnerGuide Rating % lower than EnerGuide Reference House: not less than 10% lower energy consumption or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	thermal energy demand intensity ≤ 45 kWh/(m ² ·year)
3	≤ 2.5	EnerGuide Rating % lower than EnerGuide Reference House: not less than 20% lower energy consumption or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	thermal energy demand intensity ≤ 40 kWh/(m ² ·year)

Table 9.36.6.3._B (continued)
Requirements for Buildings Located Where the Degree-Days Below 18°C Value is 3000 to 3999⁽¹⁾
 Forming Part of Sentence 9.36.6.3.(1)

Step	Airtightness (Air Changes per Hour at 50 Pa Pressure Differential)	Performance Requirement of <i>Building</i> Equipment and Systems	Performance Requirement of <i>Building</i> Envelope
4	≤ 1.5	EnerGuide Rating % lower than EnerGuide Reference House: not less than 40% lower energy consumption or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	thermal energy demand intensity ≤ 30 kWh/(m ² •year)
5	≤ 1.0	<u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	thermal energy demand intensity ≤ 20kWh/(m ² •year)

Notes to Table 9.36.6.3.B:

(1) See Sentence 1.1.3.1.(1) and Table C-2 in Appendix C.

Table 9.36.6.3._C
Requirements for Buildings Located Where the Degree-Days Below 18°C Value is 4000 to 4999⁽¹⁾
 Forming Part of Sentence 9.36.6.3.(1)

Step	Airtightness (Air Changes per Hour at 50 Pa Pressure Differential)	Performance Requirement of <i>Building</i> Equipment and Systems	Performance Requirement of <i>Building</i> Envelope
1	N/A	EnerGuide Rating % lower than EnerGuide Reference House: not less than 0% lower energy consumption or conform to Subsection 9.36.5.	
2	≤ 3.0	EnerGuide Rating % lower than EnerGuide Reference House: not less than 10% lower energy consumption or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	thermal energy demand intensity ≤ 60 kWh/(m ² •year)
3	≤ 2.5	EnerGuide Rating % lower than EnerGuide Reference House: not less than 20% lower energy consumption or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	thermal energy demand intensity ≤ 50 kWh/(m ² •year)
4	≤ 1.5	EnerGuide Rating % lower than EnerGuide Reference House: not less than 40% lower energy consumption or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	thermal energy demand intensity ≤ 40 kWh/(m ² •year)

Table 9.36.6.3.-C (continued)
Requirements for Buildings Located Where the Degree-Days Below 18°C Value is 4000 to 4999⁽¹⁾
 Forming Part of Sentence 9.36.6.3.(1)

Step	Airtightness (Air Changes per Hour at 50 Pa Pressure Differential)	Performance Requirement of <i>Building</i> Equipment and Systems	Performance Requirement of <i>Building</i> Envelope
5	≤ 1.0	<u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	thermal energy demand intensity ≤ 25kWh/(m ² •year)

Notes to Table 9.36.6.3.C:

(1) See Sentence 1.1.3.1.(1) and Table C-2 in Appendix C.

Table 9.36.6.3.-D
Requirements for Buildings Located Where the Degree-Days Below 18°C Value is 5000 to 5999⁽¹⁾
 Forming Part of Sentence 9.36.6.3.(1)

Step	Airtightness (Air Changes per Hour at 50 Pa Pressure Differential)	Performance Requirement of <i>Building</i> Equipment and Systems	Performance Requirement of <i>Building</i> Envelope
1	N/A	<u>EnerGuide Rating % lower than EnerGuide Reference House:</u> not less than 0% lower energy consumption or conform to Subsection 9.36.5.	
2	≤ 3.0	<u>EnerGuide Rating % lower than EnerGuide Reference House: not less than 10% lower energy consumption</u> or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	<u>thermal energy demand intensity</u> ≤ 80 kWh/(m ² •year)
3	≤ 2.5	<u>EnerGuide Rating % lower than EnerGuide Reference House: not less than 20% lower energy consumption</u> or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	<u>thermal energy demand intensity</u> ≤ 70 kWh/(m ² •year)
4	≤ 1.5	<u>EnerGuide Rating % lower than EnerGuide Reference House: not less than 40% lower energy consumption</u> or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	<u>thermal energy demand intensity</u> ≤ 55 kWh/(m ² •year)
5	≤ 1.0	<u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	<u>thermal energy demand intensity</u> ≤ 35kWh/(m ² •year)

Notes to Table 9.36.6.3.D:

(1) See Sentence 1.1.3.1.(1) and Table C-2 in Appendix C.

Table 9.36.6.3.-E
Requirements for Buildings Located Where the Degree-Days Below 18°C Value is 6000 to 6999⁽¹⁾
 Forming Part of Sentence 9.36.6.3.(1)

Step	<u>Airtightness</u> <u>(Air Changes per Hour at 50 Pa Pressure</u> <u>Differential)</u>	<u>Performance Requirement of</u> <u>Building Equipment and Systems</u>	<u>Performance Requirement of</u> <u>Building Envelope</u>
1	N/A	<u>EnerGuide Rating % lower than EnerGuide Reference House:</u> <u>not less than 0% lower energy consumption</u> or <u>conform to Subsection 9.36.5.</u>	
2	≤ 3.0	<u>EnerGuide Rating % lower than</u> <u>EnerGuide Reference House: not less</u> <u>than 10% lower energy consumption</u> or <u>the applicable mechanical energy use</u> <u>intensity requirements in Table</u> <u>9.36.6.3.-G</u>	<u>thermal energy demand intensity</u> $\leq 100 \text{ kWh}/(\text{m}^2\cdot\text{year})$
3	≤ 2.5	<u>EnerGuide Rating % lower than</u> <u>EnerGuide Reference House: not less</u> <u>than 20% lower energy consumption</u> or <u>the applicable mechanical energy use</u> <u>intensity requirements in Table</u> <u>9.36.6.3.-G</u>	<u>thermal energy demand intensity</u> $\leq 90 \text{ kWh}/(\text{m}^2\cdot\text{year})$
4	≤ 1.5	<u>EnerGuide Rating % lower than</u> <u>EnerGuide Reference House: not less</u> <u>than 40% lower energy consumption</u> or <u>the applicable mechanical energy use</u> <u>intensity requirements in Table</u> <u>9.36.6.3.-G</u>	<u>thermal energy demand intensity</u> $\leq 65 \text{ kWh}/(\text{m}^2\cdot\text{year})$
5	≤ 1.0	<u>the applicable mechanical energy use</u> <u>intensity requirements in Table</u> <u>9.36.6.3.-G</u>	<u>thermal energy demand intensity</u> $\leq 50 \text{ kWh}/(\text{m}^2\cdot\text{year})$

Notes to Table 9.36.6.3.E:

(1) See Sentence 1.1.3.1.(1) and Table C-2 in Appendix C.

Table 9.36.6.3.-F
Requirements for Buildings Located Where the Degree-Days Below 18°C Value is more than 6999⁽¹⁾
 Forming Part of Sentence 9.36.6.3.(1)

Step	<u>Airtightness</u> (Air Changes per Hour at 50 Pa Pressure Differential)	<u>Performance Requirement of Building Equipment and Systems</u>	<u>Performance Requirement of Building Envelope</u>
1	N/A	<u>EnerGuide Rating % lower than EnerGuide Reference House:</u> <u>not less than 0% lower energy consumption</u> or <u>conform to Subsection 9.36.5.</u>	
2	≤ 3.0	<u>EnerGuide Rating % lower than EnerGuide Reference House: not less than 10% lower energy consumption</u> or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	<u>thermal energy demand intensity</u> $\leq 120 \text{ kWh}/(\text{m}^2\cdot\text{year})$
3	≤ 2.5	<u>EnerGuide Rating % lower than EnerGuide Reference House: not less than 20% lower energy consumption</u> or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	<u>thermal energy demand intensity</u> $\leq 105 \text{ kWh}/(\text{m}^2\cdot\text{year})$
4	≤ 1.5	<u>EnerGuide Rating % lower than EnerGuide Reference House: not less than 40% lower energy consumption</u> or <u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	<u>thermal energy demand intensity</u> $\leq 80 \text{ kWh}/(\text{m}^2\cdot\text{year})$
5	≤ 1.0	<u>the applicable mechanical energy use intensity requirements in Table 9.36.6.3.-G</u>	<u>thermal energy demand intensity</u> $\leq 60 \text{ kWh}/(\text{m}^2\cdot\text{year})$

Notes to Table 9.36.6.3.F:

(1) See Sentence 1.1.3.1.(1) and Table C-2 in Appendix C.

Table 9.36.6.3.-G
Mechanical Energy Use Intensity Requirements
Forming Part of Sentence 9.36.6.3.(1)

Heating Degree-Days of Building Location, ⁽¹⁾ in Celsius Degree-Days	Amount of the Building's Conditioned Space Served by Space-Cooling Equipment	Step	Floor Area of Conditioned Space (m ²)					
			≤ 50	51 to 75	76 to 120	121 to 165	166 to 210	> 210
			Mechanical Energy Use Intensity, kWh/(m ² -year)					
<u>Less than 3000</u>	<u>Not more than 50%</u>	<u>2</u>	<u>135</u>	<u>120</u>	<u>90</u>	<u>75</u>	<u>65</u>	<u>60</u>
		<u>3</u>	<u>120</u>	<u>100</u>	<u>75</u>	<u>63</u>	<u>53</u>	<u>50</u>
		<u>4</u>	<u>90</u>	<u>80</u>	<u>60</u>	<u>48</u>	<u>40</u>	<u>40</u>
		<u>5</u>	<u>65</u>	<u>55</u>	<u>40</u>	<u>30</u>	<u>25</u>	<u>25</u>
	<u>More than 50%</u>	<u>2</u>	<u>170</u>	<u>148</u>	<u>108</u>	<u>85</u>	<u>73</u>	<u>65</u>
		<u>3</u>	<u>155</u>	<u>128</u>	<u>93</u>	<u>73</u>	<u>60</u>	<u>55</u>
		<u>4</u>	<u>125</u>	<u>108</u>	<u>78</u>	<u>58</u>	<u>48</u>	<u>45</u>
		<u>5</u>	<u>100</u>	<u>83</u>	<u>58</u>	<u>40</u>	<u>33</u>	<u>30</u>
<u>3000 to 3999</u>	<u>Not more than 50%</u>	<u>2</u>	<u>145</u>	<u>130</u>	<u>100</u>	<u>85</u>	<u>75</u>	<u>70</u>
		<u>3</u>	<u>135</u>	<u>115</u>	<u>90</u>	<u>78</u>	<u>68</u>	<u>65</u>
		<u>4</u>	<u>100</u>	<u>90</u>	<u>70</u>	<u>58</u>	<u>50</u>	<u>50</u>
		<u>5</u>	<u>70</u>	<u>60</u>	<u>45</u>	<u>35</u>	<u>30</u>	<u>30</u>
	<u>More than 50%</u>	<u>2</u>	<u>180</u>	<u>158</u>	<u>118</u>	<u>95</u>	<u>83</u>	<u>75</u>
		<u>3</u>	<u>170</u>	<u>143</u>	<u>108</u>	<u>88</u>	<u>75</u>	<u>70</u>
		<u>4</u>	<u>135</u>	<u>118</u>	<u>88</u>	<u>68</u>	<u>58</u>	<u>55</u>
		<u>5</u>	<u>105</u>	<u>88</u>	<u>63</u>	<u>45</u>	<u>38</u>	<u>35</u>
<u>4000 to 4999</u>	<u>Not more than 50%</u>	<u>2</u>	<u>160</u>	<u>145</u>	<u>115</u>	<u>100</u>	<u>90</u>	<u>85</u>
		<u>3</u>	<u>145</u>	<u>125</u>	<u>100</u>	<u>88</u>	<u>78</u>	<u>75</u>
		<u>4</u>	<u>105</u>	<u>95</u>	<u>75</u>	<u>63</u>	<u>55</u>	<u>55</u>
		<u>5</u>	<u>80</u>	<u>70</u>	<u>55</u>	<u>45</u>	<u>40</u>	<u>40</u>
	<u>More than 50%</u>	<u>2</u>	<u>195</u>	<u>173</u>	<u>133</u>	<u>110</u>	<u>98</u>	<u>90</u>
		<u>3</u>	<u>180</u>	<u>153</u>	<u>118</u>	<u>98</u>	<u>85</u>	<u>80</u>
		<u>4</u>	<u>140</u>	<u>123</u>	<u>93</u>	<u>73</u>	<u>63</u>	<u>60</u>
		<u>5</u>	<u>115</u>	<u>98</u>	<u>73</u>	<u>55</u>	<u>48</u>	<u>45</u>
<u>5000 to 5999</u>	<u>Not more than 50%</u>	<u>2</u>	<u>185</u>	<u>170</u>	<u>140</u>	<u>125</u>	<u>115</u>	<u>110</u>
		<u>3</u>	<u>165</u>	<u>145</u>	<u>120</u>	<u>108</u>	<u>98</u>	<u>95</u>
		<u>4</u>	<u>120</u>	<u>110</u>	<u>90</u>	<u>78</u>	<u>70</u>	<u>70</u>
		<u>5</u>	<u>95</u>	<u>85</u>	<u>70</u>	<u>60</u>	<u>55</u>	<u>55</u>
	<u>More than 50%</u>	<u>2</u>	<u>220</u>	<u>198</u>	<u>158</u>	<u>135</u>	<u>123</u>	<u>115</u>
		<u>3</u>	<u>200</u>	<u>173</u>	<u>138</u>	<u>118</u>	<u>105</u>	<u>100</u>
		<u>4</u>	<u>155</u>	<u>138</u>	<u>108</u>	<u>88</u>	<u>78</u>	<u>75</u>
		<u>5</u>	<u>130</u>	<u>113</u>	<u>88</u>	<u>70</u>	<u>63</u>	<u>60</u>

Table 9.36.6.3.-G (continued)
Mechanical Energy Use Intensity Requirements
Forming Part of Sentence 9.36.6.3.(1)

Heating Degree-Days of Building Location, ⁽¹⁾ in Celsius Degree-Days	Amount of the Building's Conditioned Space Served by Space-Cooling Equipment	Step	Floor Area of Conditioned Space (m ²)					
			≤ 50	51 to 75	76 to 120	121 to 165	166 to 210	> 210
			Mechanical Energy Use Intensity, kWh/(m ² -year)					
6000 to 6999	Not more than 50%	2	205	190	160	145	135	130
		3	185	165	140	128	118	115
		4	135	125	105	93	85	85
		5	105	95	80	70	65	65
	More than 50%	2	240	218	178	155	143	135
		3	220	193	158	138	125	120
		4	170	153	123	103	93	90
		5	140	123	98	80	73	70
More than 6999	Not more than 50%	2	225	210	180	165	155	150
		3	200	180	155	143	133	130
		4	150	140	120	108	100	100
		5	115	105	90	80	75	75
	More than 50%	2	260	238	198	175	163	155
		3	235	208	173	153	140	135
		4	185	168	138	118	108	105
		5	150	133	108	90	83	80

Notes to Table 9.36.6.3.-G:

(1) See Sentence 1.1.3.1.(1) and Table C-2 in Appendix C.

2) Except as permitted by Sentence (3),

- a) energy performance shall be calculated in conformance with Article 9.36.6.4., and
- b) airtightness shall be tested in accordance with Article 9.36.6.5.

(See Note A-9.36.6.3.(2).)

3) *Buildings* designed and constructed to conform to Step 5 of any of the Tables referred to in Sentence (1) and to the Passive House Planning Package, version 9 or newer, are deemed to comply with this Subsection if the energy model according to which the *building* is designed and constructed is prepared by a Certified Passive House Designer, or Certified Passive House Consultant, who is approved by the Passive House Institute.

5 Article 9.36.6.4. of Division B is repealed and the following substituted:

9.36.6.4. Energy Modelling

1) Energy modelling shall be performed using a computer program that employs calculation methods that have been tested in accordance with ANSI/ASHRAE 140, "Evaluation of Building Energy Analysis Computer Programs" with variations in the computer program from the range recommended therein reported in accordance with Division C.

2) Energy modelling shall conform to

- a) Subsection 9.36.5.,
- b) the EnerGuide Rating System, version 15 or newer (see Note A-9.36.6.4.(2)(b)), or
- c) Clauses 10.2.3.4.(1)(a) and (b) and Sentences 10.2.3.4.(3) and (4). (See Note A-9.36.6.4.(2)(c).)

- 3) The Performance Requirement of Building Equipment and Systems and the Performance Requirement of Building Envelope required under Sentence 9.36.6.3.(1) shall both be modelled using the same
- a) energy modelling methods, and
 - b) climatic data, *soil* conditions, operating schedules and temperature set-points.
- 4) For *buildings* conforming to the requirements of any of Steps 2 to 5, energy modelling shall account for the air leakage rate derived in accordance with Article 9.36.6.5.
(See Note A-9.36.6.4.(4).)

6 Sentence 9.36.6.5.(1) of Division B is repealed and the following substituted:

- 1) *Buildings* shall be tested for airtightness in accordance with
 - a) CAN/CGSB 149.10, “Determination of the Airtightness of Building Envelopes by the Fan Depressurization Method”,
 - b) ASTM E 779, “Standard Test Method for Determining Air Leakage Rate by Fan Pressurization”, or
 - c) USACE Version 3, “Air Leakage Test Protocol for Building Envelopes” or
 - d) the applicable standards and requirements of the EnerGuide Rating System, Version 15 or newer.

7 Note A-9.36.6.2. of Division B is repealed and the following substituted:

A-9.36.6.2. Floor Area in the Energy Step Code. The words floor area, as used in Sentence 9.36.6.2.(1), Sentence 9.36.6.2.(3), Sentence 9.36.6.3.(1), Sentence 10.2.3.2.(1), and Sentence 10.2.3.2.(2) of Division B, and Sentence 2.2.8.3.(3) of Division C are not italicized, to differentiate them from the defined term floor area in Article 1.4.1.2. of Division A.

Different modelling approaches identify the applicable floor area in various ways (e.g. modelled floor area, heated floor area, treated floor area, etc.) and the use of the words floor area in Sentence 9.36.6.2.(1), Sentence 9.36.6.2.(3), Sentence 9.36.6.3.(1), Sentence 10.2.3.2.(1), and Sentence 10.2.3.2.(2) of Division B, and Sentence 2.2.8.3.(3) of Division C is intended to accommodate the various modelling approaches.

8 Note A-9.36.6.4.(2)(c) of Division B is repealed and the following substituted:

A-9.36.6.4.(2)(c) NECB. Although the energy model calculation methods of the NECB are permitted to be used, the results of those calculations must reflect the definitions and the requirements related to mechanical energy use intensity and thermal energy demand intensity as set out in Articles 9.36.6.2. and 9.36.6.3., and not the Annual Energy Consumption as required by Part 8 of the NECB.

Changes to Division B-Part 10

9 Subsection 10.2.2. of Division B is repealed and the following substituted:

10.2.2. Design and Construction

10.2.2.1. Design and Construction

- 1) Except as permitted in Article 10.2.2.2., *buildings* shall be designed and constructed to conform to
 - a) ANSI/ASHRAE/IES 90.1, “Energy Standard for Buildings Except Low-Rise Residential Buildings” (except Subsection 8.4.2.),
 - b) the NECB, or
 - c) Subsection 10.2.3.
- 2) Where a *building* contains one or more *major occupancies* that conform to Subsection 10.2.3., the remaining *major occupancies* shall comply with Clause (1)(a) or (b).

10.2.2.2. Application to Existing Buildings

(See Note A-10.2.2.2.)

1) Where a *building* or *major occupancy* designed and constructed to conform to any version of ANSI/ASHRAE/IES 90.1, “Energy Standard for Buildings Except Low-Rise Residential Buildings” is altered, rehabilitated, or renovated, or there is a change in *occupancy*, the energy performance of the *alteration*, rehabilitation, renovation, or change in *occupancy* shall comply with Clause 10.2.2.1.(1)(a) or (c).

2) Notwithstanding Article 1.1.1.1. of Division A of the NECB, where a *building* or *major occupancy* designed and constructed to conform to any version of the NECB is altered, rehabilitated, or renovated, or there is a change in *occupancy*, the energy performance of the *alteration*, rehabilitation, renovation or change in *occupancy*, shall comply with Clause 10.2.2.1.(1)(b) or (c).

3) Notwithstanding Article 1.1.1.1. of Division A of the NECB, where a *building* or *major occupancy* designed and constructed to conform to any version of Subsection 10.2.3. is altered, rehabilitated, renovated, or there is a change in *occupancy*, the energy performance of the *alteration*, rehabilitation, renovation, or change in *occupancy*, shall comply Clauses 10.2.2.1.(1)(b) or (c).

4) Notwithstanding Article 1.1.1.1. of Division A of the NECB, where a *building* or *major occupancy* that is not described in Sentences (1) through (3) is altered, rehabilitated, renovated, or there is a change in *occupancy*, the energy performance of the *alteration*, rehabilitation, renovation, or change in *occupancy* shall comply with Sentence 10.2.2.1.(1).

10 Article 10.2.3.1. of Division B is repealed and the following substituted:

10.2.3.1. Application

1) This Subsection applies to *buildings* containing any of the following *major occupancies*:

- a) *residential*,
- b) *business and personal services*, or
- c) *mercantile*.

(See Sentence 1.1.3.1.(1) and Table C-2 in Appendix C.)

11 Article 10.2.3.2. of Division B is repealed and the following substituted:

10.2.3.2. Definitions

(See Note A-9.36.6.2.)

1) For the purpose of this Subsection, the term “total energy use intensity” shall mean a metric of the energy used over a year by the *building*, estimated by using an energy model in accordance with Article 10.2.3.4., normalized per square metre of floor area of *conditioned space* and expressed in kWh/(m²·year), for all of the following combined:

- a) space-heating equipment,
- b) space-cooling equipment,
- c) fans,
- d) interior and exterior lighting devices,
- e) service water heating equipment,
- f) pumps,
- g) auxiliary HVAC equipment (see A-9.36.6.2.(1)(f) in Appendix A),
- h) receptacle loads and miscellaneous equipment,
- i) appliances, and
- j) elevators and escalators.

2) For the purpose of this Subsection, the term “thermal energy demand intensity” shall mean a metric of the annual heating required by the *building* for space conditioning and for conditioning of ventilation air, estimated by using an energy model in accordance with Article 10.2.3.4., normalized per square metre of floor area of *conditioned space* and expressed in kWh/(m²·year), taking into account all of the following:

- a) thermal transmittance of above-ground walls and roof-ceiling assemblies,
- b) thermal transmittance of floors and walls in contact with the ground, or space that is not *conditioned space*,
- c) thermal transmittance and solar heat gain of windows, doors and skylights,
- d) air leakage through the *air barrier system*,
- e) internal heat gains from occupants and equipment, and
- f) heat recovery from exhaust ventilation.

(See Note A-10.2.3.2.(2).)

3) For the purpose of this Subsection, the term “Step” shall mean a Step referred to in Tables 10.2.3.3.-A and 10.2.3.3.-B.

12 Article 10.2.3.3. of Division B is repealed and the following substituted:

10.2.3.3. Compliance Requirements

1) *Buildings* and *major occupancies* conforming to the requirements of any of Steps 1 to 4 shall be designed and constructed to conform to the applicable energy performance requirements in Tables 10.2.3.3.-A and 10.2.3.3.-B.

Table 10.2.3.3.-A
Energy Performance Requirements for Residential Occupancies
 Forming part of Sentences 10.2.3.3.(1) and (2)

Step	Hotels and Motels	Other Group C Occupancies	Hotels and Motels	Other Group C Occupancies
	Equipment and Systems – Maximum Total Energy Use Intensity, kWh/(m ² ·year)		Building Envelope – Maximum Thermal Energy Demand Intensity, kWh/(m ² ·year)	
1	Conform to Part 8 of the NECB			
2	<u>170</u>	130	<u>30</u>	45
3	<u>140</u>	120	<u>20</u>	30
4	<u>120</u>	100	<u>15</u>	15

Table 10.2.3.3.-B
Energy Performance Requirements for Business and Personal Services or Mercantile Occupancies
 Forming part of Sentences 10.2.3.3.(1) and (2)

Step	Offices	Other Group D and E Occupancies	Offices	Other Group D and E Occupancies
	Equipment and Systems – Maximum Total Energy Use Intensity, kWh/(m ² ·year)		Building Envelope – Maximum Thermal Energy Demand Intensity, kWh/(m ² ·year)	
1	Conform to Part 8 of the NECB			
2	<u>130</u>	170	<u>30</u>	30
3	<u>100</u>	120	<u>20</u>	20

2) Except as permitted by Sentence (3),

- a) energy performance shall be calculated in conformance with Article 10.2.3.4., and
- b) airtightness shall be tested in accordance with Article 10.2.3.5.

(See Note A-10.2.3.3.(2).)

3) *Buildings* and *major occupancies* designed and constructed to conform to Step 4 of Table 10.2.3.3.-A or to Step 3 in Table 10.2.3.3.-B, and to the Passive House Planning Package, version 9 or newer, are deemed to comply with this Subsection provided the energy model according to which the *building* or the *major occupancy* of the *building* is designed and constructed is prepared by a Certified Passive House Designer, or Certified Passive House Consultant, who is approved by the Passive House Institute.
(See also Sentence 10.2.2.1.(2).)

13 Article 10.2.3.4. of Division B is repealed and the following substituted:

10.2.3.4. Energy Modelling

(See Note A-10.2.3.4.)

- 1) Except as required by Sentence (2), for *buildings* and *major occupancies* conforming to the requirements of any of Steps 1 to 4, energy modelling shall conform to
 - a) the applicable requirements of Part 8 of the NECB, and
 - b) the City of Vancouver Energy Modelling Guidelines.
- 2) Except as permitted by Sentence (3), energy modelling for *buildings* and *major occupancies* conforming to the requirements of any of Steps 2 to 4 shall account for the air leakage rate derived in accordance with Article 10.2.3.5.
- 3) Until the air leakage rate determined by Sentence (2) is available, an air leakage rate determined in accordance with the City of Vancouver Energy Modelling Guidelines shall be used.
- 4) In case of conflict between the provisions of the NECB and the City of Vancouver Energy Modelling Guidelines, the provisions of the City of Vancouver Energy Modelling Guidelines shall govern.

14 The Following Note is added:

A-10.2.2.2. Energy Requirements for Alterations to Buildings and Major Occupancies. Alterations, rehabilitation, renovations and changes of occupancy to existing buildings or major occupancies that were originally designed and constructed to previous editions of the ANSI/ASHRAE/IES 90.1 standard are to comply with the edition of the ANSI/ASHRAE/IES 90.1 standard referenced in this Code, or the requirements of Subsection 10.2.3. Alterations, rehabilitation, renovations and changes of occupancy to existing buildings or major occupancies that were originally designed and constructed to previous editions of the NECB or Subsection 10.2.3. are to comply with the edition of the NECB referenced in this Code, or to Subsection 10.2.3. Existing buildings or major occupancies that were not designed and constructed to any version of the ANSI/ASHRAE/IES 90.1 standard, the NECB or Subsection 10.2.3. may use the edition of the ANSI/ASHRAE/IES 90.1 standard or the NECB referenced in this Code, or Subsection 10.2.3. for alterations, rehabilitation, renovations and changes in occupancy.

Sentence 1.1.1.2.(1) of Division A states that the level of building performance shall not be decreased below a level that already exists. For example, a new occupancy may be permitted a higher lighting power density by the ANSI/ASHRAE/IES 90.1 standard or the NECB than the lighting power density that was permitted for a previous occupancy. This does not constitute a decrease in the level of building performance, provided the design meets the minimum requirements of the relevant Code or standard.

15 Note A-10.2.3.4. is repealed and the following substituted:

A-10.2.3.4. Energy Modelling

Energy Model Calculations for Steps 2 to 4

Notwithstanding the requirements of Part 8 of the NECB, a reference building and building energy target are not required for compliance with the requirements of Steps 2 to 4 in Article 10.2.3.3. The performance requirements of Table 10.2.3.3.-A. and Table 10.2.3.3.-B. are used to determine compliance.

Air Leakage Rate in Energy Model Calculations

The requirement to account for the air leakage rate as tested in all energy model calculations, other than for Step 1 buildings, supersedes the NECB air leakage rate requirements. For buildings that must conform to the requirements of any of Steps 2 to 4, higher than expected air leakage may require the building design to be altered and the energy model calculations to be repeated. Alternatively, the air leakage rate could be retested after making alterations to the air barrier system to attain the desired air leakage rate.

Air Leakage Rate in Energy Model Calculations for Step 1

Although the air leakage rate as tested of the building need not be used for the purposes of conforming with Part 8 of the NECB and Sentence 10.2.3.4.(2), Article 2.2.9.1. of Division C requires that the air leakage rate as tested be used in the calculation of the total energy use intensity and thermal energy demand intensity for reporting purposes on the drawings and specifications. This will typically require Step 1 energy model calculations to be redone after the airtightness test. It is not intended that the results of the airtightness test for buildings that must conform to the requirements of Step 1 influence the compliance of the building with Article 10.2.3.3.

Air Leakage Rate

Section 2.4. of the City of Vancouver’s Energy Modelling Guidelines provides guidance on determining infiltration/air leakage rates for buildings conforming with Section 10.2.3. at the design stage.

Changes to Division B - Appendix C

16 Table C-4 of Division B is amended by repealing the following items:

Jordan River	Required
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Qualicum Beach	Required
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and substituting the following:

Jordan River	<u>Not Required</u>
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Qualicum Beach	<u>Not Required</u>
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Changes to Division C - Part 2

17 Article 2.2.2.1. of Division C is repealed and the following substituted:

2.2.2.1. General Information Required

- 1) Sufficient information shall be provided to show that the proposed work will conform to this Code and whether or not it may affect adjacent property.
- 2) Plans shall be drawn to scale and shall indicate
 - a) the nature and extent of the work or proposed *occupancy* in sufficient detail to establish that, when completed, the work and the proposed *occupancy* will conform to this Code,
 - b) the applicable edition of the Code,
 - c) whether the *building* is designed under Part 3 or Part 9,
 - d) the *major occupancy* classifications of the *building*,
 - e) the *building area* and *building height*,
 - f) the number of *streets* the *building* faces,
 - g) the *accessible* entrances, work areas and washrooms,
 - h) the *accessible* facilities particular to the *occupancies*, and

-
- i) the energy compliance path to which the *building* conforms, and, where a *building* conforms to Subsection 9.36.6. or 10.2.3. of Division B, the Step to which it conforms.
- 3) When proposed work is changed during construction, information on the changes shall comply with the requirements of this Section for proposed work.

18 Article 2.2.8.3. of Division C is repealed and the following substituted:

2.2.8.3. House Performance Compliance Calculation Report

- 1) A house performance compliance calculation report shall be provided in accordance with Sentence (2) for each proposed house design.
- 2) In addition to the drawings and specifications required in Article 2.2.8.2., the house performance compliance calculation report shall include
- a) a project information section containing
 - i) the name or identifier of the project,
 - ii) a description of the project,
 - iii) the address of the project,
 - iv) the name and version of the calculation tool,
 - v) the geographic region in which the proposed house is to be built, and
 - vi) the identifier for the climatic data set used for analysis,
 - b) a summary of the characteristics of the *building* envelope, HVAC system and service water heating system reflecting the information provided in Article 2.2.8.2.,
 - c) an energy performance data summary containing
 - i) the annual energy consumption of all energy sources calculated for the proposed house (see Note A-2.2.8.3.(2)(c)(i)), and
 - ii) the house energy target of all energy sources calculated for the reference house,
 - d) where a software program is used to determine compliance,
 - i) the name of the software program(s), and
 - ii) a list of any adaptations made by the user to the software relating to input or output values, and
 - e) a statement that the calculation was performed in compliance with
 - i) Subsection 9.36.5. of Division B,
 - ii) Sentence 9.36.6.3.(3) of Division B,
 - iii) Sentence 9.36.6.4.(2) of Division B, or
 - iv) Sentence 9.36.6.4.(3) of Division B.
- 3) Where a building complies with Subsection 9.36.6. of Division B, the energy performance data summary in Clause (2)(c) shall also contain
- a) the floor area of *conditioned space* used for the energy modelling calculations (see Note A-9.36.6.2. of Division B).
 - b) the mechanical energy use intensity,
 - c) the thermal energy demand intensity,
 - d) where applicable, the EnerGuide Rating % lower than EnerGuide Reference House for the *building*,
 - e) for *buildings* conforming to Step 1, the airtightness of the *building* as tested, derived in accordance with Article 9.36.6.5. of Division B, and recorded in air changes per hour at 50 Pa, and
 - f) for *buildings* conforming to any of Steps 2 to 5, the airtightness of the *building* as tested that is accounted for in accordance with Sentence 9.36.6.4.(4) of Division B, and derived in accordance with Article 9.36.6.5., recorded in air changes per hour at 50 Pa.

4) The mechanical energy use intensity in Clause (3)(b), the thermal energy demand intensity in Clause (3)(c), and the EnerGuide Rating % lower than EnerGuide Reference House in Clause (3)(d) shall account for the airtightness referenced in Clause (3)(e) or (f), as applicable.

19 Article 2.2.9.2. of Division C is repealed and the following substituted:

2.2.9.2. Information Required

1) For *buildings* and *major occupancies* that are designed and constructed in compliance with Subsection 10.2.3. of Division B, design drawings, specifications, or an energy design report shall indicate

- a) the total energy use intensity as defined by Sentence 10.2.3.2.(1) of Division B,
- b) the energy use intensity of major energy services separately, including
 - i) space heating,
 - ii) space cooling,
 - iii) service water heating,
 - iv) lighting, and
 - v) other plug loads,
- c) the thermal energy demand intensity as defined by Sentence 10.2.3.2.(2) of Division B, and
- d) the air leakage rate as derived in accordance with Sentence 10.2.3.4.(3). of Division B, and recorded in $L/(s \cdot m^2)$ at 75 Pa.

2) For *buildings* and *major occupancies* that are designed and constructed in compliance with Subsection 10.2.3. of Division B, before an owner occupies or receives permission to occupy the *building*, an energy report shall indicate

- a) the total energy use intensity as defined by Sentence 10.2.3.2.(1) of Division B.
- b) the energy use intensity of major energy services separately, including
 - i) space heating.
 - ii) space cooling.
 - iii) service water heating.
 - iv) lighting, and
 - v) other plug loads.
- c) the thermal energy demand intensity as defined by Sentence 10.2.3.2.(2) of Division B.
- d) for *buildings* conforming to Step 1, the air leakage rate as tested, derived in accordance with Article 10.2.3.5. of Division B, and recorded in $L/(s \cdot m^2)$ at 75 Pa, and
- e) for *buildings* conforming to any of Steps 2 to 4, the air leakage rate as tested that is accounted for in accordance with Sentence 10.2.3.4.(2) of Division B and derived in accordance with Article 10.2.3.5. of Division B, recorded in $L/(s \cdot m^2)$ at 75 Pa.

3) The total energy use intensity in Clause (2)(a) and the thermal energy demand intensity in Clause (2)(c) shall account for the airtightness referenced in Clause (2)(d) or (e), as applicable.