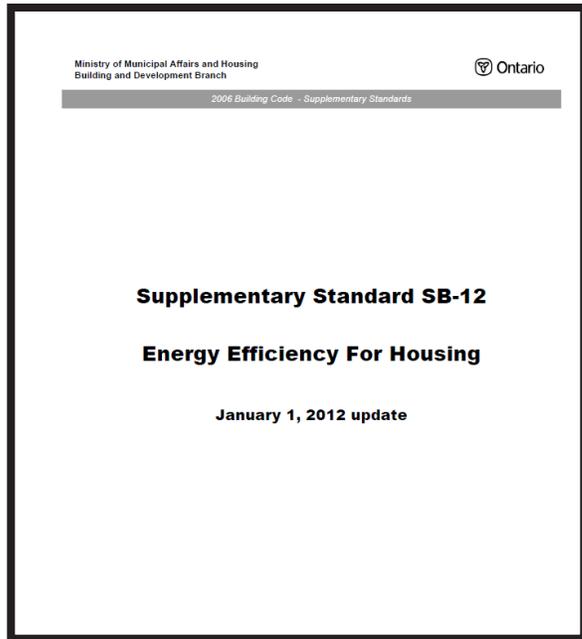


The province of Ontario has adopted its own set of energy efficiency requirements for residential and commercial buildings. Building permits applied for after December 31, 2011, are required to meet the new energy efficiency requirements.

The requirements differ from the upcoming National Building Code of Canada 2010, Part 9, Energy Efficiency Requirements, and the National Energy Code for Buildings 2011. However, the intent is the same - to force better building envelope designs that require more air tight structures with a continuous air barrier, and greater thermal insulation values.

The new energy code prescriptive requirements are a natural fit for buildings constructed with LOGIX. However, other wall systems, such as CMU and framed walls, are looking at more labor and material costs, to meet the new air leakage and greater insulation requirements.

This document summarizes the new energy code requirements in Ontario related to wall systems, in particular thermal insulation and air leakage requirements.



**SB-12 ENERGY EFFICIENCY FOR HOUSING (Residential)**

Effective since January 1, 2012, the SB-12 covers the energy efficiency requirements for residential buildings that fall within the scope of Part 9 of the OBC.

Under Section 12 of the OBC, SB-12 is offered as an option to show compliance with energy efficiency requirements that meet or exceed Energuide 80 standards.

Blower door tests are not required when all energy efficiency requirements of SB-12 are met.

**Insulation Values**

SB-12 offers a number of prescriptive paths to achieving the energy efficiency requirements. The table below lists the range of insulation values from the prescriptive paths, and is grouped into two Climate Zones based on heating degree days.

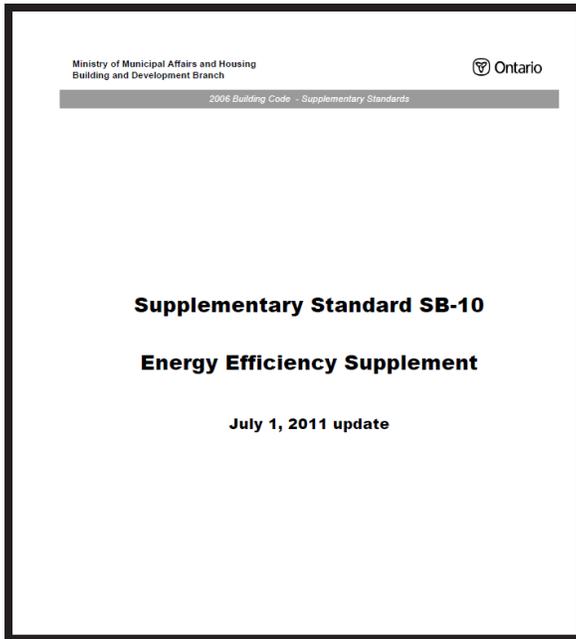
	Climate Zones			
	1 < 5000 HDD <sup>3</sup>		2 ≥ 5000 HDD <sup>3</sup>	
	Above-grade, RSI(R) <sup>1,2</sup>	Below-grade, RSI(R) <sup>1,2</sup>	Above-grade, RSI(R) <sup>1,2</sup>	Below-grade, RSI(R) <sup>1,2</sup>
AFUE <sup>4</sup> > 90%	3.87 (R22) to 4.75 (R27)	2.11 (R12) to 3.87 (R22)	3.87 (R22) to 5.11 (R29)	2.11 (R12) to 3.87 (R22)
AFUE ≥ 78% & AFUE < 90%	4.75 (R27) to 5.11 (R29)	2.11 (R12) to 3.52 (R20)	5.11 (R29)	3.52 (R20)
Electric Space Heating	5.11 (R29)	2.11 (R12) to 3.52 (R20)	5.11 (R29)	3.52 (R20)

1. Insulation values shown are for the insulation material only.
2. Thermal insulation values are in metric, or RSI units. For reference, the converted imperial, or R-values, are in parenthesis.
3. AFUE = annual fuel utilization efficiency
4. See Section 2.1.1 of SB-12 for full list of prescriptive paths, and corresponding minimum insulation values.

*Energuide 80 is a standard measure used to indicate the energy efficiency of a home based on a scale of zero to 100.*

*An Energuide Rating of zero means a home has no insulation, major air leakage, and high energy consumption.*

*An Energuide Rating of 100 means a home is well insulated, air tight, well ventilated, and requires no purchased energy.*



The above table shows that the required R-value can range from R-22 to R-29 for above-grade walls, and R-12 to R-29 for below-grade walls, depending on the efficiency of the heating equipment used.

LOGIX PRO forms, which offer R-23 on the insulation form panels, can meet R-value requirements up to R-23<sup>1</sup>. LOGIX Platinum or XRV panels can be used to meet the higher R-value requirements<sup>2</sup>.

The new insulation values also take into account thermal bridging effects found in stud walls. As a result, stud framed walls will require about 20 to 25% more insulation, as required by Section 2.1.1.4 of SB-12.

*HDD stands for Heating Degree Days. In basic terms, HDD is a measure of the amount of heat energy required to maintain a constant indoor air temperature, typically at 18°C, as outdoor temperatures fluctuate. HDD increases in colder climates since more heat energy is required to maintain a constant temperature.*

**SB-10 ENERGY EFFICIENCY SUPPLEMENT (Commercial/multi-residential)**

Effective since January 1, 2012, SB-10 covers the energy efficiency requirements for commercial buildings in Ontario.

The overall intent of the update to SB-10 is to create buildings that are more energy efficient than other national energy codes (i.e., 25% more than the Model National Energy Code for Buildings 1997)

*To compare the prescriptive R-value requirements against LOGIX R-values, a table showing the R-values of various LOGIX wall assemblies has been prepared. The table can be found on page 6 of Technical Bulletin 30, Total R-value of LOGIX Wall Assemblies.*

**Insulation Values Above-grade**

The following table lists the prescriptive minimum insulation values for above-grade walls from SB-10. Climate Zones in SB-10 are grouped into 3 Climate Zones based on heating degree days, as shown.

	Climate Zone 5 (<4000 HDD)		
	Nonresidential	Residential	Semiheated
<b>Mass Walls, R-value (ICFs)</b>	13.3ci	15.2ci	7.6ci
<b>Metal Framed, R-value</b>	13.0cav + 10.0ci	13.0cav + 10.0ci	13.0cav + 3.8ci
<b>Metal Building, R-value</b>	13.0cav + 13.0ci	13.0cav + 13.0ci	13.0cav + 6.5ci
<b>Wood Framed &amp; Other, R-value</b>	13.0cav + 7.5ci	13.0cav + 10.0ci	13.0cav + 3.8ci

	Climate Zone 6 (4000 ≤ HDD < 5000)		
	Nonresidential	Residential	Semiheated
<b>Mass Walls, R-value (ICFs)</b>	15.2ci	20.0ci	9.5ci
<b>Metal Framed, R-value</b>	13.0cav + 10.0ci	13.0cav + 10.0ci	13.0cav + 3.8ci
<b>Metal Building, R-value</b>	13.0cav + 13.0ci	13.0cav + 13.0ci	13.0cav + 6.5ci
<b>Wood Framed &amp; Other, R-value</b>	13.0cav + 10.0ci	13.0cav + 10.0ci	13.0cav + 3.8ci

	Climate Zone 7 (≥ 5000 HDD)		
	Nonresidential	Residential	Semiheated
<b>Mass Walls, R-value (ICFs)</b>	20.0ci	20.0ci	11.4ci
<b>Metal Framed, R-value</b>	13.0cav + 10.0ci	13.0cav + 18.8ci	13.0cav + 3.8ci
<b>Metal Building, R-value</b>	13.0cav + 13.0ci	13.0cav + 19.5ci	13.0cav + 6.5ci
<b>Wood Framed &amp; Other, R-value</b>	13.0cav + 10.0ci	13.0cav + 10.0ci	13.0cav + 3.8ci

1. See Table SB5.5-5 to SB5.5-7 of SB-10 for more detail.
2. Insulation values shown are for the insulation material only.
3. cav = cavity insulation, ci = continuous insulation.

*A complete list of total R-values for LOGIX form products is available in Section 8.5 of the LOGIX Design Manual.*

The above table shows that for above-grade walls LOGIX 4" PRO forms can meet the prescriptive insulation requirements for all Climate Zones<sup>1</sup>.

For other wall systems continuous insulation is required in all Climate Zones, in addition to the cavity insulation. This could mean having to add 1 to 3 inches of rigid foam sheathing to meet this requirement.

### Insulation Values Below-grade

The following table lists the prescriptive minimum insulation values for below-grade walls from SB-10.

	Climate Zone 5 (<4000 HDD) & Climate Zone 6 (4000 ≤ HDD < 5000)		
	Nonresidential	Residential	Semiheated
Below-grade Walls, R-value	10.0ci	10.0ci	7.5ci

	Climate Zone 7 (≥ 5000 HDD)		
	Nonresidential	Residential	Semiheated
Below-grade Walls, R-value	10.0ci	12.5ci	7.5ci

1. See Table SB5.5-5 to SB5.5-7 of SB-10 for more detail.
2. Insulation values shown are for the insulation material only.
3. ci = continuous insulation.

The insulation requirements for below-grade walls can be met with LOGIX PRO forms. Similar to the above-grade wall requirements, other wall systems will require an additional layer of continuous insulation.

1. Intertek Test Report, Thermal Resistance of LOGIX ICF Wall System
2. Intertek Test Report, Thermal Resistance of LOGIX ICF Wall System Project #100050754COQ-001.

Proper design of the exterior walls of a building play a significant role in complying with the new energy requirements. Because LOGIX creates air-tight structures that naturally create a continuous air barrier and excellent insulation values the new energy targets will be easy to achieve for buildings using LOGIX. However, framed wall and CMU construction will be more expensive to build with as it struggles to meet the new energy requirements.

For further information contact your local LOGIX representative or e-mail [info@logixcf.com](mailto:info@logixcf.com).

**Related Articles:**

1. Technical Bulletin 23, Thermal Performance: The ICF Effect
2. Technical Bulletin 27, Changes to the Canadian Building Codes
3. Technical Bulletin 28, Changes to the US Building Codes 2012
4. Technical Bulletin 30, Total R-value of LOGIX Wall Assemblies
5. Technical Bulletin 32, Changes to Canadian Energy Codes 2012 - Commercial & Residential
6. Technical Bulletin 33, Changes to the US Energy Codes 2012 - Commercial & Residential