

Product Information Bulletin

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2006 OBC, Supplementary Standard SB-12

Part 9 Residential Occupancy Requirements (March 15, 2013)

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The Advantage ICF System® is an energy efficient insulating concrete forming (ICF) system consisting of a monolithic layer of expanded polystyrene (EPS) insulation over the interior and exterior face of a concrete core.

2006 Ontario Building Code (OBC), Supplementary Standard SB-12, provides three compliance options to achieve energy efficient design of buildings with residential occupancy required to comply with 2006 OBC, Division B, Part 9.

1. Select an applicable prescriptive compliance package from SB-12, Subsection 2.1.1.
2. Design to the performance compliance method in SB-12, Subsection 2.1.2., or
3. Design to comply with the technical requirements of NRCan "**Energy Star for New Homes: Technical Specifications**" as specified in SB-12, Subsection 2.1.3.

Note: SB-12 compliance options 2 and 3 require detailed design of all aspects of the energy efficiency design of buildings using recognized simulation software to calculate annual energy use.

SB-12, Chapter 2, Tables 2.1.1.2.A, 2.1.1.2.B, 2.1.1.2.C, 2.1.1.3.A, 2.1.1.3.B and 2.1.1.3.C provide prescriptive compliance packages which include requirements for the minimum thermal performance and energy efficiency of building envelope and space heating equipment, domestic hot water heating equipment and heat recovery ventilators equipment. **NOTE:** The minimum thermal performance for wall components listed in the tables are minimum RSI expressed in units of m²•K/W (R-value expressed in units of ft²•hr•°F/BTU) – see note 1 to Tables 1 and 2.

Table 1 provides Advantage ICF System options that meet minimum RSI (R-value) requirements for insulation of basement walls complying with 2006 OBC, Supplementary Standard SB-12.

Table 1 - Advantage ICF System Options for Insulation of Basement Walls

2006 OBC, SB-12 Compliance Packages	Climate Zones	Minimum RSI (R-value) (See note 1)	Advantage ICF System	
			Insulation Thickness	RSI (R-value)
Tables 2.1.1.2.A & 2.1.1.3.A, Packages A to J and M: Advantage ICF System for basement walls	1 & 2	2.11 (12) to 3.52 (20)	Type 2 EPS Insulation 2 x 2 5/8" = 5 1/4" (see note 2)	See Table 3
Table 2.1.1.2.B, A to F and Table 2.1.1.2.C, Packages A to B: Advantage ICF System for basement walls	1	2.11 (12) to 3.52 (20)	Type 2 EPS Insulation 2 x 2 5/8" = 5 1/4" (see note 2)	See Table 3
Table 2.1.1.3.B, A to B and Table 2.1.1.3.C, Package A: Advantage ICF System for basement walls	2	2.11 (12) to 3.52 (20)	Type 2 EPS Insulation 2 x 2 5/8" = 5 1/4" (see note 2)	See Table 3
Tables 2.1.1.2.A & 2.1.1.3.A, Package L: Advantage ICF System for basement walls (see note 4)	1 & 2	3.87 (22)	Type 2 EPS Insulation 2 x 2 5/8" = 5 1/4" (see note 2)	See Table 3

Table 1 Notes:

1. The thermal resistance (RSI/R-value) recognized for an ICF wall in SB-12 is the total thermal resistance of the entire wall assembly. For other types of wall systems, the values listed are minimum RSI/R-values for the thermal insulation component only.
2. Advantage ICF System uses EPS insulation meeting CAN/ULC-S701, type 2 with a thermal resistance value of RSI-0.70 per 25 mm (R-4.04 per inch) of thickness.
3. Compliance package L applies only to buildings with minimum RSI-3.87 (R-22) ICF basement walls.

Table 2 provides Advantage ICF System options that meet minimum RSI (R-value) for insulation of basement walls and walls above grade wall required for the 2006 OBC, Supplementary Standard SB-12 compliance packages noted.

Table 2 - Advantage ICF System Options for Insulation of Combined Walls Above Grade & Basement Walls

2006 OBC, SB-12 Compliance Packages	Climate Zones	Minimum RSI (R-value) (See note 1)	Advantage ICF System	
			Insulation Thickness	RSI (R-value)
Tables 2.1.1.2.A & 2.1.1.3.A, Package K: <i>Advantage ICF System for walls above grade & basement walls (see note 3)</i>	1 & 2	3.87 (22)	Type 2 EPS Insulation 2 x 2 5/8" = 5 1/4" (see note 2)	See Table 3
Tables 2.1.1.2.A & 2.1.1.3.A, All Packages: <i>Advantage ICF System for walls above grade & basement walls (see note 4)</i>	1 & 2	3.87 (22)	Type 2 EPS Insulation 2 x 2 5/8" = 5 1/4" (see note 2)	See Table 3

Table 2 Notes:

1. The thermal resistance (RSI/R-value) recognized for an ICF wall in SB-12 is the total thermal resistance of the entire wall assembly. For other types of wall systems, the values listed are minimum RSI/R-values for the thermal insulation component only.
2. Advantage ICF System uses EPS insulation meeting CAN/ULC-S701, type 2 with a thermal resistance value of RSI-0.70 per 25 mm (R-4.04 per inch) of thickness.
3. Compliance package K applies only to a building with ICF basement walls and ICF walls above grade with minimum RSI-3.87 (R-22).
4. Any other compliance package except compliance package K is permitted to be used for a building with both ICF basement walls and ICF above grade walls.

Wood studs used in wood-frame construction act as thermal bridges reducing the overall *effective thermal resistance* of building assemblies. The *effective thermal resistance* of building envelope components with framing members such as wood frame walls with wood studs at typical spacing of 400 or 600 mm (16" or 24") on center is calculated using the formula below.

$$\text{Effective Thermal Resistance} = \frac{100\%}{\frac{\% \text{ Area with Framing}}{\text{RSI (R) Framed Portion}} + \frac{\% \text{ Area Without Framing}}{\text{RSI (R) Insulated Portion}}}$$

The Advantage ICF System does not contain any framing members. Therefore, the effective thermal resistance for wall assemblies constructed with the Advantage ICF System is calculated as the sum of the thermal resistance values for all components in the wall assembly. Typical calculations for above grade and basement wall assemblies using Advantage ICF System are provided in Table 3 below.

Table 3 – Typical Effective Thermal Resistance Calculation

Component	Advantage ICF System			
	Above Grade Wall		Basement Wall	
	RSI	R-value	RSI	R-value
Outside Air Film (above grade)	0.03	0.2		
Metal Siding	0.11	0.6		
Sheathing Paper	0.01	0.1		
EPS Thermal Insulation	1.87	10.6	1.87	10.6
152 mm (6") Concrete Wall	0.08	0.5	0.08	0.5
EPS Thermal Insulation	1.87	10.6	1.87	10.6
Gypsum Wall Board, 13 mm (1/2")	0.08	0.4	0.08	0.4
Inside Air Film	0.12	0.7	0.12	0.7
Total RSI (R-value)	4.17	23.6	4.02	22.8