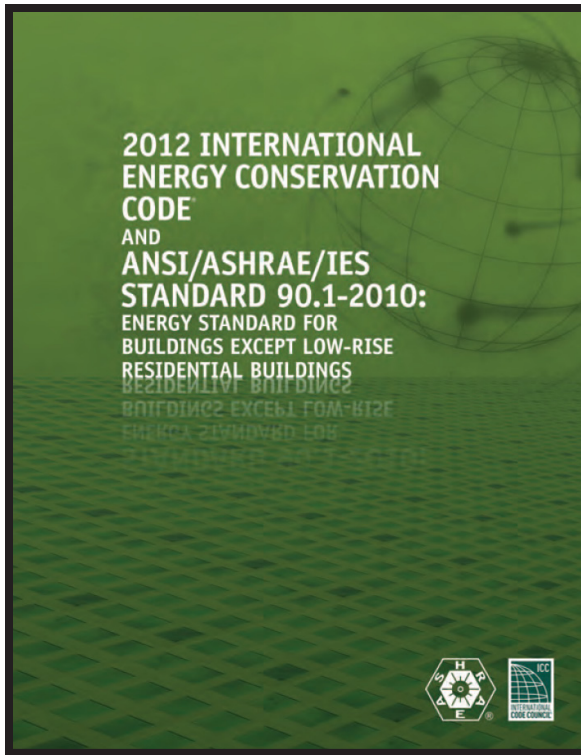


## CHANGES TO THE US ENERGY CODES 2012 - COMMERCIAL & RESIDENTIAL



Many changes have been made to the new energy code requirements. Among them the demand for better building envelope designs that require more airtight structures with a continuous air barrier, and greater thermal insulation values.

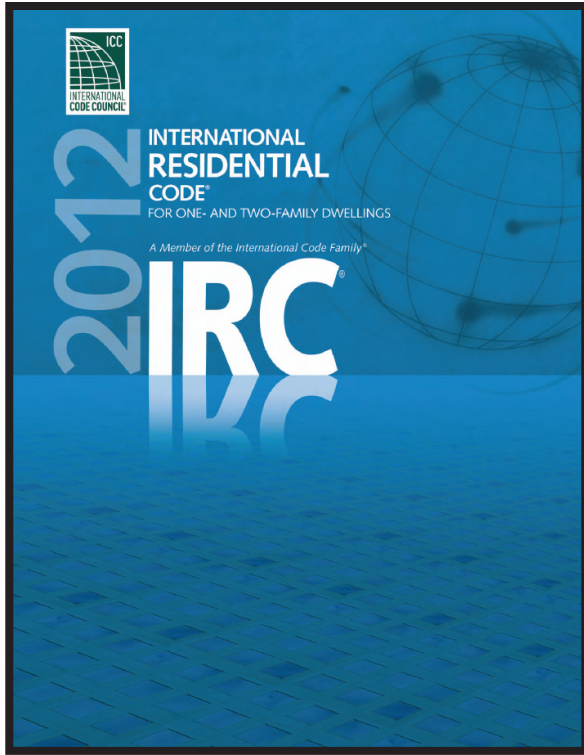
The new energy code prescriptive requirements are a natural fit for buildings constructed with LOGIX. However, other wall systems, such as CMU and framed walls, are looking at more labor and material costs, to meet the new air leakage and greater insulation requirements.

This document summarizes the new energy code requirements related to wall systems, in particular thermal insulation and air leakage requirements in Chapter 11 and 13 of the 2012 International Residential Code (IRC) and International Building Code (IBC), respectively.

**2012 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)**  
Chapter 4 in the Commercial and Residential Provisions of the 2012 IECC form the basis for the energy efficiency requirements found in the 2012 IBC and IRC, respectively.

Recently released in mid-2011, the major changes in the 2012 IECC centers on creating buildings that use 30% less energy than that required by the 2006 IECC edition.

# CHANGES TO THE US ENERGY CODES 2012 - COMMERCIAL & RESIDENTIAL



## CHANGES TO ENERGY EFFICIENCY REQUIREMENTS - RESIDENTIAL (Chapter 11, 2012 IRC)

The energy efficiency requirements for residential buildings are covered under Chapter 11 of the 2012 IRC.

### Higher Insulation Values

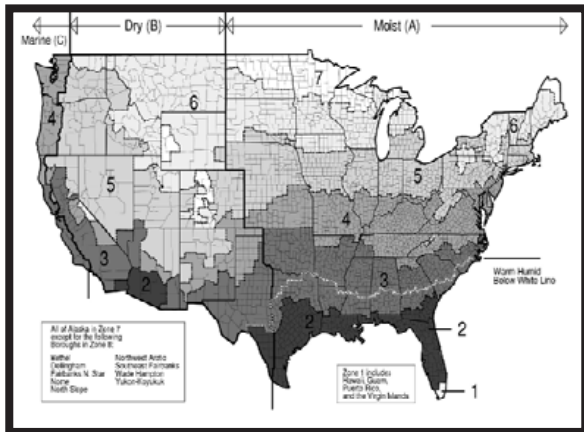
The following table lists the prescriptive minimum insulation values from Chapter 11 for mass walls, wood-framed, and basement walls<sup>1</sup>. The insulation requirements have increased from previous editions, in particular for framed walls.

Climate Zones	Mass Walls Above-grade, R-value (ICFs) <sup>*, **</sup>	Wood-framed Walls Above-grade, R-value <sup>**, ***</sup>	Basements & Crawl Spaces, R-value <sup>**, ***</sup>
1	3/4	13cav	0
2	4/6	↓	↓
3	8/13	20cav OR 13cav + 5ci	5ci OR 13cav
4 Except Marine	↓	↓	10ci OR 13cav
5 & Marine 4	13/17	↓	15ci OR 19cav
6	15/20	20cav + 5ci OR 13cav + 10ci	↓
7 & 8	19/21	↓	↓

\* The second insulation value is required when more than half the insulation is located in the interior side of the wall.

\*\* R-values are for the insulation material only.

\*\*\* cav = cavity insulation, ci = continuous insulation.



The EPS form panels of LOGIX PRO forms provide an insulation value of R-23<sup>2</sup>, which exceeds the requirements in all Climate Zones in both above-grade and basement walls.

Framed walls in Climate Zones 3 to 8, however, will require either more cavity insulation, or a combination of cavity and continuous insulation, for both above-grade and basement walls. The amount of additional insulation could be as much as adding 1 to 3 inches of rigid foam sheathing.



In the warmer Climate Zones the amount of required insulation may not be significant. However, designers, home owners and builders, should consider the strength and durability that LOGIX provides for buildings in Climate Zones 1 and 2.

Climate Zones 1 and 2 are in areas where hurricanes typically occur. LOGIX can provide structures built to withstand extreme wind conditions, and wind-borne debris, more efficiently than masonry and framed construction. For more information see Technical Bulletin 31, *Disaster Resistance: LOGIX in Hurricane & Tornado Prone Regions*. This technical bulletin also offers high wind load reinforcement tables and a complete drawing set for the construction of FEMA approved Safe Rooms.

*ACH (air changes per hour) is a measure of the volume of air that is replaced every hour in a defined space at a given air pressure. The lower the ACH the more airtight the building.*

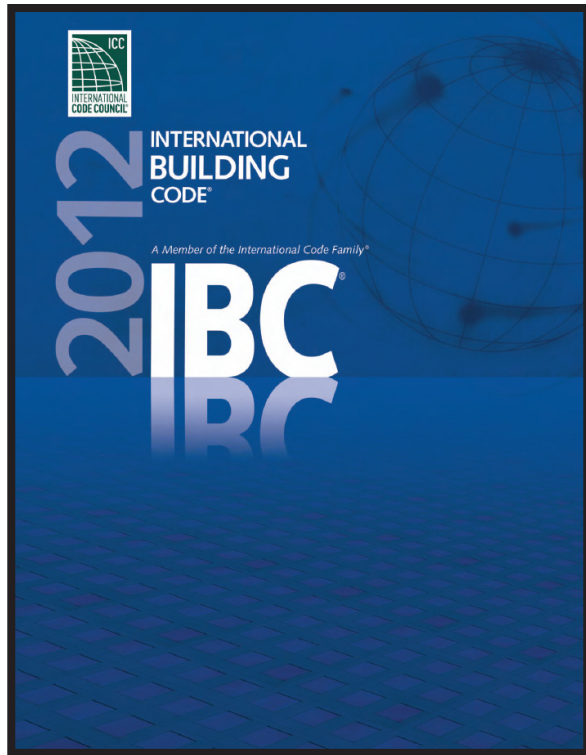
### Air Leakage Requirements

Blower Door tests are required to determine air leakage rates. The new air leakage rates are noted below<sup>3</sup>.

- Zones 1 & 2  $\leq$  5 ACH at 50 kPa
- Zones 3 to 8  $\leq$  3 ACH at 50 kPa

Typically testing at less than 1 ACH at 50 kPa, buildings constructed with LOGIX for the exterior walls will have no trouble meeting the air leakage requirements. However, framed walls will require more sealing measures to meet the air leakage requirements in Climate Zones 3 to 8.

## CHANGES TO THE US ENERGY CODES 2012 - COMMERCIAL & RESIDENTIAL

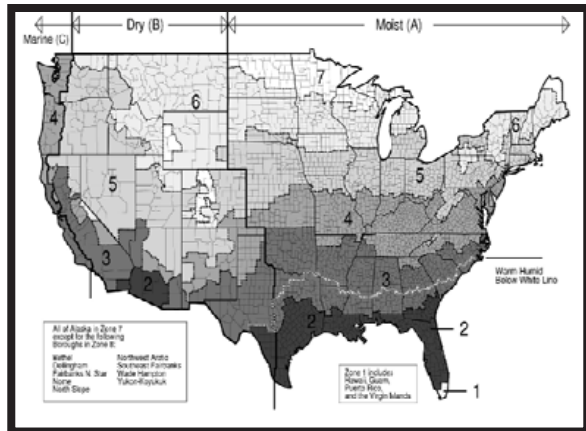


### CHANGES TO ENERGY EFFICIENCY REQUIREMENTS - COMMERCIAL (Chapter 13, 2012 IBC)

The energy efficiency requirements for commercial buildings are covered under Chapter 13 of the 2012 IBC, which refers to the Commercial Provisions of the 2012 IECC.

#### Higher Insulation Values Above-grade

The following table lists the prescriptive minimum insulation values for above-grade walls from the Commercial Provisions of the 2012 IECC<sup>4</sup>. The insulation requirements have increased from previous editions, in particular for metal and wood framed walls.



Climate Zones	Mass Walls Above-grade <sup>*,**</sup> , R-value (ICFs)	Metal Framed Above-grade <sup>*,**</sup> , R-value	Metal Building Above-grade <sup>*,**</sup> , R-value	Wood Framed & Other <sup>*,**</sup> , R-value
1	5.7ci	13cav + 5ci	13cav + 6.5ci	13cav + 3.8ci OR 20cav
2	7.6ci	13cav + 7.5ci	13cav + 13ci	
3	9.5ci			
4 Except Marine	11.4ci			
5 & Marine 4	13.3ci			13cav + 7.5ci OR 20cav + 3.8ci
6	15.2ci			
7		13cav + 15.6ci	13cav + 19.5ci	
8	25ci	13cav + 19.5ci		13cav + 15.6ci OR 20cav + 10ci

\* R-values are for the insulation material only.

\*\* cav = cavity insulation, ci = continuous insulation.

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

The EPS form panels of LOGIX PRO forms provides an insulation value of R-23<sup>2</sup>, which exceeds the requirements in Climate Zones 1 to 7. For Climate Zone 8 LOGIX Platinum form panels, which provides R-26<sup>5</sup>, exceeds the minimum R-25 insulation requirement.

Metal and wood framed walls, however, will require either more cavity insulation, or a combination of cavity and continuous insulation, to meet the minimum insulation values in all Climate Zones.

#### **Higher Insulation Values Below-grade**

For below-grade, greater insulation values are required compared to previous editions of the energy code for commercial buildings<sup>4</sup>.

Climate Zones	Below-grade Walls
1	NR*
2	NR*
3	NR*
4 to 6	7.5ci
7	10ci
8	12.5ci

\*NR = Not required

LOGIX PRO forms can easily meet the requirements for below-grade walls in all Climate Zones. Metal and wood framed walls will require an additional layer of continuous insulation ranging from R-7.5 to R-12.5 depending on the Climate Zone.

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

### **Air Leakage Requirements**

Unlike the air leakage requirements for residential buildings, Blower Door tests are not required for cast-in-place concrete walls since they are considered air barriers. Therefore, LOGIX, which acts as a continuous air barrier, is exempt from Blower Door test requirements.

However, framed walls will require the Blower Door test. Walls built with masonry will have to be fully grouted or painted in order to be considered an air barrier, and exempt from the Blower Door test.

Creating more energy efficient buildings is the primary focus of new building and energy codes. As a result, proper design of the exterior walls of a building play an important role in complying with the new energy requirements.

By providing airtight structures with a continuous air barrier, and continuous insulation with high R-values, LOGIX already meets the anticipated new energy requirements. On-the-other-hand, framed structures will become more expensive to build with, requiring more labor and material costs, in order to meet the new energy requirements.

For further information contact your local LOGIX representative or e-mail [info@logixicf.com](mailto:info@logixicf.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 34, Ontario Energy Codes 2012 - Commercial & Residential

1. See 2012 IRC, Table 1102.1.1
2. Intertek Test Report 3048347
3. See 2012 IRC, N1102.4.1.2
4. See 2012 IECC, Table C402.2
5. Intertek Test Report, Thermal Resistance of LOGIX ICF Wall System Project #100050754COQ-001.