

# INTRODUCTION

Topics of Residential Energy Codes were discussed at the last Membership Meeting, and in particular St. Charles City, Richmond Heights, and Clayton were addressed. ACCA-St. Louis has investigated each area and these are the results of our investigation.

## ST. CHARLES CITY Brad Kerans 636.949.3593

### Ordinance

[http://www.amlegal.com/nxt/gateway.dll/Missouri/stcharle/cityofstcharlesmissouricodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:stcharles\\_mo](http://www.amlegal.com/nxt/gateway.dll/Missouri/stcharle/cityofstcharlesmissouricodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:stcharles_mo)

**NOTE: 2006 IRC will be adopted by the end of the summer and will contain changes to the ordinance**

### 150.020 INTERNATIONAL RESIDENTIAL CODE FOR ONE- AND TWO-FAMILY DWELLINGS ADOPTED BY REFERENCE.

#### 150.021 AMENDMENTS.

(Z) Section N1102.5 Alternate Design shall be added to read as follows:

The following section is added and can be used as an alternative to the previous sections of chapter 11.

##### 1. Minimum R Values:

A. Roof/ceiling **R-30**

B. 2 x 4 wood frame walls and band joists/board **R-13**

C. Floor over unheated crawl space **R-19**

D. Concrete/masonry basement foundation walls

For finished basement areas **R-5**

For Unfinished basement areas **R-5**

*Exception: Unfinished basements may have up to a maximum of 20% of the total basement wall area exposed above the outside finished grade/ground level as un-insulated concrete walls. The foundation wall area above the outside grade/ground level that may be un-insulated is determined by the formula .20 times the basement wall height of all walls (including insulated exterior frame walls for walk-out basements and walls common to both basement and attached garages) times the perimeter of these basement walls. In unfinished areas the basement foundation wall insulation shall extend down to the basement floor slab or to a minimum of 24 inches below outside finished grade when the grade is above the floor slab elevation.*

E. Slab-on-grade floors:

Minimum **R-4.2** (unheated slab)

Minimum **R-6.2** (heated slab)

*Note: The insulation shall be along the perimeter of the foundation wall downward from the slab a minimum distance of 24" or horizontally under the slab for a minimum of 24".*

2. **Doors. All metal doors shall be insulated. Exception: Overhead garage doors**

3. **Windows. All skylights shall be double-glazed. Windows for natural ventilation of unfinished basements may be single-glazed. All other windows shall comply with one of the three following conditions:**

A. For window areas that do not exceed 24% of the gross insulated frame wall area of the entire building:

1. Use double-glazed windows with ½" minimum (gross overall thickness) clear glass, with either aluminum frame with thermal break, vinyl frame, wood frame or fiberglass frame, or;

2. Use a window having a maximum overall U-value not more than 0.56.

**B.** For window areas greater than 24% and not more than 30% of the gross insulated frame wall area of the entire building use one of the two following options:

1. Use double-glazed windows with ½" minimum (gross overall thickness) clear glass, with either aluminum frame with thermal break, vinyl frame, wood frame or fiberglass frame. In addition, one of the following must be provided:

a. Windows must be treated with low-emissivity (Low E) film, or;

b. The exterior walls shall be sheathed with a minimum of ½" insulated sheathing with a minimum **R-value of 3.**

2. The maximum U-value of all windows shall not exceed 0.51.

**C.** For window areas that exceed 30% of the gross insulated frame wall area of the entire building, calculations that confirm compliance with the provisions of this code shall be required.

(Ord. 97-152, approved 5-8-97; Am. Ord. 98-494, approved 11-19-98; Am. Ord. 02-46, approved 3-5-02; Am. Ord. 05-152, approved 5-27-05)

## **Richmond Heights Mike Margherio, Senior Inspector 314.646.7658**

### **Ordinance:**

<http://codes.sullivanpublications.com/richmondheights-slp/>

**21. Chapter 11 Energy Efficiency is hereby amended by deleting in their entirety Section 1101 and Section 1102 (pages 311 through 321) and replacing them with the following Sections and Subsections.**

*Chapter 11, Energy Efficiency*

*Section N1101, General*

***N1101.1 Scope. This Chapter sets forth energy-efficiency related requirements for the design and construction of buildings regulated by this code.***

#### ***Exceptions:***

1. Provided that they are separated by building envelope assemblies from the remainder of the building, portions of the building that do not enclose conditioned space shall be exempt from the building envelope provisions but shall comply with the provisions for building mechanical and service water heating systems.
2. Accessory buildings or portions thereof, which are neither heated nor cooled.

**N1101.2 Compliance. Compliance with this Chapter shall be demonstrated by meeting the requirements of the applicable Sections of this Chapter.**

**N1101.2.1 Detached One- and Two-Family Dwellings. Compliance shall be demonstrated by either:**

1. Meeting the requirements of this Chapter for buildings with a glazing area that does not exceed thirty percent (30%) of the gross area of exterior walls; or
2. Meeting the requirements of the International Energy Conservation Code for detached one- and two-family dwellings.

**N1101.2.2 Townhouses. Compliance shall be demonstrated by either:**

1. Meeting the requirements of this Chapter for buildings with a glazing area that does not exceed thirty percent (30%) of the gross area of exterior walls; or
2. Meeting the requirements of the International Energy Conservation Code for residential buildings of Group "R-2," "R-4" or town houses.

**N1101.3 Identification. Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this Chapter.**

**N1101.4 Building thermal envelope insulation. An R-value identification mark shall be applied by the**

manufacturer to each piece of building thermal envelope insulation twelve (12) inches (305 mm) or more wide. Alternately, the insulation installers shall provide a certification listing the type, manufacturer and R-value of insulation installed in each element of the building thermal envelope. For blown or sprayed insulation (fiberglass and cellulose), the initial installed thickness, settled thickness, settled R-value, installed density, coverage area and number of bags installed shall be listed on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the area covered and R-value of installed thickness shall be listed on the certificate. The insulation installer shall sign, date and post the certificate in a conspicuous location on the job site.

**N1101.4.1 Blown or sprayed roof/ceiling insulation.** The thickness of blown in or sprayed roof/ceiling insulation (fiberglass or cellulose) shall be written in inches (mm) on markers that are installed at least one (1) for every three hundred (300) feet (28 mm) throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers a minimum of one (1) inch (25 mm) high. Each marker shall face the attic access opening. Spray polyurethane foam thickness and installed R-value shall be listed on the certificate provided by the insulation installer.

**N1101.4.2 Insulation mark installation.** Insulating materials shall be installed such that the manufacturer's R-value mark is readily observable upon inspection.

**N1101.5 Fenestration.** The U-factor of fenestration shall be determined in accordance with NFRC 100 and labeled and certified by the manufacturer. The solar heat gain coefficient (SHGC) of fenestration shall be determined in accordance with NFRC 200 and labeled and certified by the manufacturer.

**N1101.5.1 Field Verification of Window Compliance.** Installed windows shall be verified in the field by manufacturer's product identification, which may consist of a shipping label, packing slip, invoice with lot number designated or other approved method.

**N1101.6 Installation.** All materials, systems and equipment shall be installed in accordance with the manufacturer's installation instructions and the provisions of this code.

**N1101.6.1 Protection of exposed foundation insulation.** Insulation applied to the exterior of basement walls, crawl space walls and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend a minimum of six (6) inches (152 mm) below grade.

**N1101.7 Above code programs.** The building official or other authority having jurisdiction shall be permitted to deem a national, State or local energy efficiency program to exceed the energy efficiency required by this Chapter. Buildings approved in writing by such an energy efficiency program shall be considered in compliance with this Chapter.

**N1101.8 Certificate. A permanent certificate shall be posted on or in the electrical distribution panel.** The certificate shall be completed by the builder or registered design professional. The certificate shall list the predominant R-values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawl space wall and/or floor) and ducts outside conditioned spaces; U-factors for fenestration; and the solar heat gain coefficient (SHGC) of fenestration. Where there is more than one (1) value for each component, the certificate shall list the value covering the largest area. The certificate shall list the type and efficiency of heating, cooling and service water heating equipment.

## ***Section N1102, Building Thermal Envelope***

**N1102.1 Thermal Performance Criteria.** The minimum required insulation R-value and the type of windows and doors provided or the maximum required fenestration U-factor for each element in the building thermal envelope (fenestration, roof/ceiling, opaque wall, floor, slab edge, crawl space wall and basement wall) shall be in accordance with the criteria listed below. The minimum required R-value shall be met by the sum of the R-values of the insulation materials installed in framing cavities and/or insulating

sheathing applied and not by framing, drywall, structural sheathing or exterior siding materials.

*Minimum R Values:*

**A. Ceiling/Roof "R-30"**

**B. Wood Frame Walls and Band Joists/Board "R-13"**

**C. Floor over Unheated Crawl Space "R-19"**

**D. Concrete/Masonry Basement Foundation Walls For:  
Finished Basement Areas "R-5" (Full Height)**

**E. Concrete/Masonry Basement Foundation Walls For:  
Unfinished Basement Areas "R-5"**

*Exception: Unfinished basements may have up to a maximum of twenty percent (20%) of the total basement wall area exposed above the outside finished grade/ground level as uninsulated concrete foundation walls. The foundation wall area above the outside grade/ground level that may be uninsulated is determined by the formula. 20 times the basement wall height of all walls (including insulated exterior frame walls for walkout basements and walls common to both basement and attached garages) times the perimeter of these basement walls. In unfinished areas the basement foundation wall insulation shall extend down to the basement floor slab or to a minimum of twenty-four (24) inches below outside finished grade when the grade is above the floor slab elevation.*

**F. Slab-On-Grade Floors Min. R-4.2 (Unheated Slab); Min. R-6.2 (Heated Slab)**

**Note: The insulation shall be along the perimeter of the foundation wall downward from the slab a minimum distance of twenty-four (24) inches or horizontally under the slab for a minimum of twenty-four (24) inches.**

**Doors: All metal doors shall be insulated.**

*Exception: Overhead garage doors.*

**Windows for natural ventilation of unfinished basements may be single glazed. All other windows shall comply with the following conditions:**

**A.** For window areas that do not exceed twenty-four percent (24%) of the gross insulated frame wall area of the entire building:

1. Use double glazed windows with one-half (1/2) inch minimum (gross overall thickness) clear glass, with either aluminum frame with thermal break, vinyl frame, wood frame or fiberglass frame or;
2. Use a window having a maximum overall U-value not more than 0.56.

**B.** For window areas greater than twenty-four percent (24%) and not more than thirty percent (30%) of the gross insulated frame wall area of the entire building, use one (1) of the two (2) following options:

1. Use double glazed windows with one-half (1/2) inch minimum (gross overall thickness) clear glass, with either aluminum frame with thermal break, vinyl frame, wood frame or fiberglass frame. In addition, one (1) of the following must be provided.
  - a. Windows shall be treated with low-emissivity (Low-E) film or;
  - b. The exterior walls shall be sheathed with a minimum of one-half (1/2) inch insulated sheathing with a minimum R-value of 3.
2. The maximum U-value of all windows shall not exceed 0.51.

**C.** For window areas that exceed thirty percent (30%) of the gross insulated frame wall area of the entire building, calculations that confirm compliance with the provisions of this code shall be required.

**Skylights: All skylights shall be double-glazed.**

**Detached one- and-two family dwellings and town houses with greater than thirty percent (30%) glazing area shall determine compliance using the building envelope requirements of Chapter 4 or 5 of the International Energy Conservation Code.**

**N1102.2 Replacement Fenestration.** Where some or all of an existing fenestration unit is replaced with an entirely new replacement fenestration product, including frame, sash and glazed portion, in an

existing building, the replacement fenestration product shall be doubled glazed or have a U-factor that does not exceed 0.56. Replacement skylights and roof windows shall be double-glazed.

**N1102.3 Building thermal envelope.** The building thermal envelope shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weather-stripped or otherwise sealed with an air barrier material, suitable film or solid material.

1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.
6. Knee walls.
7. Walls and ceilings separating the garage from conditioned spaces.
8. Behind tubs and showers on exterior walls.
9. Common walls between dwelling units.
10. Other sources of infiltration.

**N1102.4 Fenestration air leakage.** Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cubic foot per minute per square foot [1.5(L/s)/m<sup>2</sup>] and swinging doors no more than 0.5 cubic foot per minute per square foot [2.5(L/s)/m<sup>2</sup>], when tested according to NFRC400 or AAMA/WDMA/CSA101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled by the manufacturer.

*Exception: Site-built windows, skylights and doors.*

**N1102.5 Moisture controls.** The building design shall not create conditions of accelerated deterioration from moisture condensation.

**Above-grade frame walls, floors and ceilings not ventilated to allow moisture to escape shall be provided with an approved vapor retarder. The vapor retarder shall be installed on the warm-in-winter side of the thermal insulation.**

*Exceptions:*

1. In construction where moisture or its freezing will not damage the materials.
2. Frame walls, floors and ceilings in jurisdictions in Zones 1, 2, 3, 4A and 4B. (Crawl space floor vapor retarders are not exempted.)
3. Where other approved means to avoid condensation are provided.

### **Section N1103, Systems**

**N1103.1 Controls.** At least one (1) thermostat shall be installed for each separate heating and cooling system.

**N1103.1.1 Heat pump supplementary heat.** Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load.

#### **N1103.2 Ducts.**

**N1103.2.1 Insulation.** Supply and return ducts shall be insulated to a minimum of R-8. Ducts in floor trusses shall be insulated to a minimum of R-6.

*Exception: Ducts or portions thereof located completely inside the building thermal envelope.*

**N1103.2.2 Sealing.** Ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.3.1.

**N1103.2.3 Building cavities.** Building framing cavities shall not be used as supply ducts.

**N1103.3 Mechanical system piping insulation.** Mechanical system piping capable of carrying fluids above

105°F (40°C) or below 55°F (13°C) shall be insulated to a minimum of R-2.

**N1103.4 Circulating hot water systems.** All circulating service hot water piping shall be insulated to at least R-2. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use.

**N1103.5 Mechanical ventilation.** Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

**N1103.6 Equipment sizing.** Heating and cooling equipment shall be sized as specified in Section M1401.3.

**22.** Chapters 12 through 42 (pages 323 through 546) are hereby deleted in their entirety.

**23.** Appendix G (pages 609--611) and P (page 641) are hereby adopted in their entirety. (Ord. No. 5025 §3, 6-4-07)

**Clayton Steve Askins, 314.290.8462**

**Ordinance**

<http://www.ci.clayton.mo.us/FileSystem/Page410/2006BuildingCode.pdf>

PART VI

2006 INTERNATIONAL ENERGY CONSERVATION CODE

**Section 101.1 is amended to read as follows :**

**Section 101.1 Title. This Code shall be known as the International Energy Conservation Code of the City of Clayton, Missouri and shall be cited as such. It is referred to herein as "this Code".**

**Source for 2006 IECC**

<http://www.amazon.com/2006-International-Energy-Conservation-Code/dp/1580012701>