



# 2006 IRC –Energy Conservation Code Requirements

## ★ Building Inspection ★



REV. 09172010

The Tennessee Clean Energy Future Act of 2009 and City of Knoxville amendments to the 2006 IRC will go into effect July 1, 2010.

**Inspections will begin October 1, 2010.**

**Inspectors will verify energy conservation code requirements based upon 2006 IRC regulations. The owner/contractor will sign the certificate verifying the type of insulation and the equivalent R-values of the house's different insulation requirements as shown below.**

AREA	INSULATION VALUE (OLD)	INSULATION VALUE (NEW)
Attic*	R-30	R-38*
Wood Frame Wall	R-13	R-13
Mass Wall	R-5	R-5 (R-10 if more than 1/2 on interior)
Floor	R-13	R-19
Basement Wall	R-10 / R-13	R-10 / R-13**
Slab	R-10 (2 ft deep)	R-10 (2 ft deep)
Crawl Space Wall (Unvented)	R-10 / R-13	R-10 / R-13**
HVAC Duct	R-6	R-8 in Attic(All other R-6)***
HVAC Refrigerant Line	R-2	R-2
Plumbing	R-2	R-2

**\*Exception:** When R-38 is required in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves (Energy Truss). Insulation markers required every 300 sq.ft.

**\*\* Exception:** R-10 applies to continuous insulation, R-13 to framing cavity insulation; either insulation meets the requirement.

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

A permanent certificate shall be posted on or in the electrical distribution panel per Section N1101.9 of the 2006 IRC.

A Insulation Inspection is required after framing is completed. Select Mechanical Inspection Item # 521 on your request.

The building thermal envelope shall be durably sealed to limit infiltration and tested or inspected in accordance with Section N1102.4 of the 2006 IRC.

## AIR BARRIER AND INSULATION INSPECTION

COMPONENT	CRITERIA
Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material.
Ceiling/attic <b>R-38 minimum</b> <b>R-30 (Energy Truss)</b>	Air barrier in any dropped ceiling/soffit is substantially aligned with insulation and any gaps are sealed. Attic access (except unvented attic), knee wall door, or drop down stair is sealed.
Walls <b>R-13 minimum</b>	Corners and headers are insulated. Junction of foundation and sill plate is sealed.
Windows and doors	Space between window/door jambs and framing is sealed.
Rim joists	Rim joists are insulated and include an air barrier.
Floors (including above garage and cantilevered floors) <b>R-19 minimum</b>	Insulation is installed to maintain permanent contact with underside of subfloor decking. Air barrier is installed at any exposed edge of floor.
Crawlspace walls / Basement walls <b>R-10 if continuous</b> <b>R-13 if in wall cavities</b>	Insulation is permanently attached to walls. Exposed earth in unvented crawlspaces is covered with Class I vapor retarder with overlapping joints sealed / taped.
Shafts, penetrations	Duct shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditional space are sealed.
Narrow cavities	Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation.
Garage separation <b>R-13 minimum</b>	Air sealing is provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures are airtight, IC rated and sealed to drywall. Exception – fixtures in conditioned space.
Plumbing <b>R-2 minimum</b> and wiring	Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring.
Shower/tub on exterior wall <b>R-13 minimum</b>	Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.
Electrical/phone box on exterior wall	Air barrier extends behind boxes or air sealed type boxes are installed.
Common wall	Air barrier is installed in common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.
Fireplace	Fireplace walls include an air barrier.

# Insulation/Energy Conservation Code Inspection Checklist

## GENERAL

- 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, crawlspace wall and/or floor) and ducts outside conditioned spaces; and *U*-factors for fenestration. The certificate shall list the type and efficiency of heating, cooling and service water heating equipment.
- Building thermal envelope.** The building thermal envelope shall be durably sealed to limit infiltration and shall be caulked, gasketed, weather stripped or otherwise sealed with an air barrier material, suitable film or solid material.
- Installation.** All materials, systems and equipment shall be installed in accordance with the manufacturer's installation instructions and the provisions of the IRC.

## ROUGH-IN

- Seal all: Vertical/Horizontal Penetrations, Wall Sheathing Penetrations/Seams, and Bottom Plates

## SLAB R-10

- 24" Perimeter R-10 insulation Horizontally/Vertically or combination. (Any portion of the slab that is 24" under the outside ground level will not need to be insulated)

## BASEMENT WALL/ CRAWL SPACE WALL R-10 CONTINUOUS OR R-13 IN CAVITIES

- Exterior walls associated with conditioned basements shall be insulated from the top of the basement wall down to 10 feet below grade or to the basement floor, whichever is less.
- Seal or caulk Mud Sill

## WALLS R-13

- No gaps or compression
- Insulation cut around obstructions
- Stapling correct: no gaps, cavity filled
- External channels, corners, and areas around tubs and showers insulated
- Small spaces filled
- Rim-joists insulated
- Bottom plate sealed
- Insulation paper not exposed

## FLOOR R-19

- The floor must be insulated to R-19, if the unconditioned basement/crawl space walls are not insulated.
- Floors are not required to be insulated if the foundation walls are insulated.
- Batts snug against floor but not compressed or buckled
- All spaces insulated
- Insulation paper not exposed
- Rim joists insulated

## ATTIC INSULATION R-38

- 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 for every 300 sq.ft. 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 1 inch 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.

- Insulation mark installation.** Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable upon inspection.
- Ceilings with attic spaces.** R-30 shall be deemed to satisfy the requirement for R-38 wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves.
- Ceilings without attic spaces.** The minimum required insulation for such roof/ceiling assemblies shall be R-30 and shall be limited to 500 sqft of ceiling area.
- No gaps or compression
- Insulation cut around obstructions
- All draft stops in place
- Cover bottom chords of trusses
- All top plates covered
- All venting clear: min. 1" clearance
- IC rated fixtures covered
- Attic access insulated
- Insulation covers entire surface
- Bag labels cut out and visible near access to attic
- Baffles installed and eave or soffit vents clear
- Insulation markers visible & indicating proper depth
- Hard covers over: cavities, drops, scuttles, bracing, and IC rated fixtures

## HVAC R-8

- Insulation. Supply and return ducts shall be insulated to a minimum of R-8 in attics. All other ducts R-6. Exception: Ducts or portions thereof located completely inside the building thermal envelope.
- 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.
- Building cavities. Building framing cavities shall not be used as supply ducts.
- Mechanical system piping insulation. Mechanical system piping capable of carrying fluids above 105°F or below 55°F shall be insulated to a minimum of R-2.

## PLUMBING R-2

- 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.
- Freezing. In localities having a winter design temperature of 32°F or lower (Knox ~17°F), a water, soil or waste pipe shall not be installed outside of a building, in exterior walls, in attics or crawl spaces, or in any other place subjected to freezing temperature unless adequate provision is made to protect it from freezing by insulation or heat or both. Water service pipe shall be installed not less than 12 inches deep and not less than 6 inches below the frost line.

## WINDOWS, DOORS, SKYLIGHTS

- Fenestration product rating. *U*-factors of fenestration products (windows U-.40, doors U-.40 and skylights U-.60) shall be determined in accordance with NFRC 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer. *U*-factor is a maximum number.