



# Town of Charlton

www.townofcharlton.net

DEPARTMENT of BUILDING  
INSPECTIONAL SERVICES

37 MAIN STREET  
CHARLTON, MA 01507  
508-248-2241

[Building.ZEO@townofcharlton.net](mailto:Building.ZEO@townofcharlton.net)

## Guidance for July 1, 2014 code changes 2012 Energy Code Under floor protection

As of July 1, 2014 all projects permitted will have to comply with the 2012 International Energy Conservation Code. In addition, for homes constructed with engineered floor systems (I joist and trusses) over basements, under floor protection will have to be installed.

### Under floor protection

**R501.3 Fire Protection of Floors.** Floor assemblies not using dimension lumber or structural composite lumber equal to or greater than 2-inch nominal dimension, shall be provided with a ½ inch gypsum wallboard membrane, 5/8 inch wood structural panel membrane, or equivalent on the underside of the floor framing member unless required elsewhere in this code to be fire resistance rated.

#### Exceptions:

1. Other approved floor assemblies demonstrating equivalent fire performance.
2. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section P2904, NFPA 13D, or other approved equivalent sprinkler system.
3. Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.
4. One room or alcove per story not exceeding 80 square feet, when supported between structural walls.

### 2012 Energy code highlights

**All air sealing, duct sealing, duct leak testing, all insulation, whole building air leakage and ventilation rates will be inspected by a third party inspector with a written report acceptable to the code official provided prior to each appropriate inspection by the code official.**

Third party inspections R402.4.1.1 “Where required by the code official...” & R402.4.1.2 Massachusetts amendment (MA) “testing and verification shall be done by a HERS rating Field Inspector or...”

The name of the third party rater must be supplied before the building permit is issued.

**Big hint** Find yourself a good HERS Rater, Energy Star company, or other energy rating professional before you start the project, they can help you with meeting all the energy code requirements, point out air sealing issues, size the HVAC equipment properly and possibly help get you some rebates.

For guidance on the code requirements Google: **BBS 2012 IECC webinar**



Curtis Meskus - Building Commissioner/Zoning Enforcement Officer

Peter Starkus – Plumbing & Gas Inspector  
Joseph Ostrowski – Inspector of Wires  
Nancy Shields – Administrative Assistant

## General requirements

Submit approved energy calculations such as REScheck or prescriptive insulation declaration.

Printed certificate will be supplied by the contractor for electrical panel. R401.3

ACCA manual J, S calculations, duct sizing and layout must be provided to the office prior to the sheathing inspection and the energy professional as needed. R103.2

### Prescriptive Insulation requirements

Floors R-30, Walls R-20 or R-13 +5, Ceiling R-49 or R-38 with full thickness over top plate both with wind wash baffles sealed in place. There is an allowance in inaccessible attic spaces to use R-30 up to 500 square feet or 20% area whichever is less. R402.1, R402.2, R402.2.3, Table R402.1.1

Attic access doors R-Value equal to the surrounding wall or ceiling, and weather striped. **Helpful hint** if you don't seal penetrations correctly you may fail the blower door test. R402.2.4

Basement walls if heated space R-15 if continuous, R-19 if cavity insulation. R402.1, Table R402.1.1

Slab on Grade floors if the basement floor is less than 12 inches below grade R-10 for 2 feet down or in from the top/edge of slab. R402.2.9, Table R402.1.1 note "d" if radiant heating is in a slab.

Eave Baffle or wind wash baffle for air permeable insulation, a baffle shall be installed adjacent to the soffit and eave vent to seal to prevent wind from blowing through the insulation. R402.2.3

Insulation General the back side of non-horizontal insulation must have an air barrier and support, for example in a knee wall the attic side of the insulation must have an air barrier. In floors the insulation must be in contact with the floor. In ceilings it is permissible to have the insulation's back side exposed however the insulation must be in contact with the ceiling. R402.2.7, R402.4.1.1

Windows and Doors U-Factor of 0.32 or better, 1 window up to 15 square feet and/or 1 door up to door 24 square feet may be exempt. Headers shall be insulated unless structural requirements supersede. R402.1, Table R402.1.1, R402.3.3, R402.3.4

Skylights U-Factor 0.55 or better, no exceptions. R402.1, Table R402.1.1

Sunrooms if thermally isolated and unheated need not be insulated. If the sunroom is heated it requires insulated ceiling R-24, walls R-13, windows need to meet the above. R402.12

Recessed lighting that breaks the thermal envelope must be air sealed and insulation contact rated. **Helpful hint** try not to use them in the thermal, air barrier envelope, they leak a lot and you may have to build and seal a foam or sheet rock box around them with sufficient clearance, I have also heard of some LEDs that look like cans, but go in a regular box. R402.4.4

Continuous Air Barriers, the highest ceiling, the second floor ceiling, cathedral ceiling is most likely going to be your upper air barrier that needs to be connected to your wall air barrier which may be your exterior sheathing and then your lower air barrier probably the floor. Any hole in this barrier, such as electrical boxes, smoke detectors, ceiling registers, recessed cans will need to be sealed to the barrier, **Helpful hint** if you use the outer sheathing as the wall air barrier the penetrations are limited, then figure out your connection to the ceiling and floor.

Fireplaces shall have tight fitting flue dampers and outdoor combustion air R402.4.2

Ducts all ducts will have all joints sealed. Attic supply ducts must be insulated to R-8 all others to R-6, if the duct system and/or air handler is outside of the building thermal envelope must be leak tested. Building cavities will not be used as ducts or plenums (no panning the joist bays). For rebate programs, ducts cannot preclude the installation of the full required R-value in the building cavity, for all others then note "a" Table R402.1.1 the required minimum insulation must be installed in cavities. R403.2 through 403.2.3 **Big hint** if your ducts are inside the thermal envelope they need not be insulated for heating, for cooling if you are concerned about condensation and you need not do the air leakage test for the duct work. R403.2.1 listed exception, R403.2.2 listed exception.

Piping insulation all pipes carrying fluids above 105 degrees or below 55 degrees Fahrenheit will be insulated with R-3 for the entire length. R403.3, R403.4

Whole-house mechanical ventilation is mandatory, at rates prescribed in R403.5 (MA). The rate is based on the number of bedrooms, square footage of the conditioned floor area and leakage rate as determined by the blower door test. The installed performance must be verified by a third party R403.5.2 (MA), see the **Big hint** on page one.

Whole House Exhausts must meet the following efficacy requirements. Range hoods 2.8 CFM/watt, Inline fan 2.8 CFM/watt, bathroom/utility less than 90cfm 1.4 CFM/watt, greater than 90cfm 2.8 CFM/watt. Maximum sound level for all fans 1 sone or 4 feet of duct work to remote fan. Table 403.5.1, R403.5.4 (MA)

Lighting equipment 75% of the lamps in fixed lighting must be high efficacy lighting. R404.1

Equipment sizing heating and cooling equipment shall be sized in accordance with ACCA Manual S, based on building load in accordance with ACCA manual J or other approved methodologies, the previous along with duct sizing and layout must be provided to the office prior to the sheathing inspection and the energy professional as needed. R103.2, R403.6 **Big Hint** as the buildings have lower air leakage rates and higher insulation values, the heating and cooling loads are reduced, allowing smaller sized equipment to be used, which should be less expensive. Using the rule of thumb for HVAC equipment sizing will cost you more for oversized equipment and lead to poor performance and customer complaints.

Fuel burning heating equipment exhaust must be mechanically drafted, directed vented or power vented, unless the natural draft meets the RESENT or BPI safety tests. R403.5.7 (MA)

Whole house leakage testing the building or dwelling shall be tested and verified to have a leakage rate not exceeding 3 air changes per hour at 50 Pascals by an approved third party. R402.4 see the **Big hint** on page one.

**Building thermal envelope** you can use the basement, behind knee wall space and attics to your advantage if you insulate and place your air barrier in a way to make the envelope as large as possible. If your thermal envelope includes the attic by insulating the underside of the roof and basement walls with your air barrier at the exterior point of these assemblies for example, then the air leakage calculation takes in to account the larger volume.

**Conditioned space** need not be to the extent of the thermal envelope, that is you apply heating and/or cooling energy to the living space only calculated for the heat loss to the unconditioned areas

### **Remodeling and/or Additions**

Existing buildings, except as specified, what exists can continue to exist as long as it was code compliant at the time of its installation. R101.4.1

Additions, alterations, renovations or repairs to an existing building shall comply with the provisions for new work, without requiring the unaltered portion to meet the new requirements, unless the conditions are hazardous. Existing cavities when exposed will be filled with insulation; roofs where the sheathing or cavity is exposed shall be insulated. R101.4.3

All air sealing will be completed for any exposed work

If the addition is isolated from the existing work, a blower door test shall be done.