Fremont
Building Official
Code Enforcement

Building Inspector
PO Box 120
295 Main Street
Fremont, NH03044
(603) 895-3200 Ext 18
(603) 895-3149 (Fax)

RESIDENTIAL INSULATION CERTIFICATION

For all new residential construction in Fremont involving living space; a Certification of Compliance to the New Hampshire Residential Energy Code is required. This certification can be obtained by contacting the Public Utilities Commission (PUC) in Concord, NH. This certification is required at the time of insulation inspection and before proceeding with additional work i.e. sheetrock or wall coverage.

Contact Info for Public Utilities Commission (PUC)	**www.puc.nh.gov**
The preferred method of contact is via mail or fax or call for appointment – provide your email on the application for quicker response. Jonathan Osgood 603-271-6306	Public Utilities Commission 21 South Fruit Street Suite 10 Concord, New Hampshire03301-2429

Effective April 1, 2010 the state of New Hampshire is effectively organized into two climate zones; with Rockingham County being in the southern most zone or Climate Zone # 5. The energy code applies to all portions of the building envelope that enclose conditioned space. Each owner/contractor must complete an application for compliance with the NH Energy Code and submit to PUC. The application involves compliance with provisions of the Residential Energy Code. The 2010 New Hampshire Residential Energy Code Application (EC-1 Form) is available on-line. This form may be viewed at http://www.puc.state.nh.us/EnergyCodes/energypg.htm or by accessing the Fremont web site at www.fremont.nh.gov. This *"EC-1 Form"*is a convenient and easy method for determining compliance to the energy code provisions.

Air leakage or air sealing is critical to good insulating performance. All penetrations in the building envelope must be effectively sealed during the construction process. For 2010 two methods of air sealing compliance are available to the contractor/home owner; (1) a formal Blower Door testin compliance with the Residential Energy Code is performed prior to occupancy and/or (2) at the time of insulation inspection a formal submission of the Air Barrier and Insulation Inspection Checklist is provided to the Building Inspector. The checklist is part of the EC-1 Form and is detailed informatively in that checklist.

The minimum wall R-value has increased to R20. Standard R-19 wall insulation is no longer in compliancewith the energy code.

Mechanical supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall beinsulated to a minimum of R-6. Ducts must be sealed.

Mechanical ventilation is strongly recommended for all new home construction because it is the only method to ensure provision for adequate levels of air exchanges is present.

Leaks are to be sealed between conditioned space and unconditioned space, and between conditioned space and outdoors. Note that fiberglass insulation batts do not stop air and cannot be considered as an air sealant.

Consider the following when insulating:

- inspection of the insulation is required prior to proceeding with wall covering
- the minimum window U-factor performance is defined in the table of the EC-1 form. U-factor stickers on new windows should remain in place for inspection
- ensure that thermal resistance value (R-value) is indicated on installed insulation for verification during inspection. Insure that the minimum R-value requirements of the certification is met
- blown-in attic areas need markers (in 1-inch high increments) attached to the rafters indicating the installed and settled thickness
- floor insulation must maintain permanent contact with the underside of the subfloor or decking. Insulation must be installed such that the insulation does not drop or fall out of the joist cavities over time.
- the vapor retarder is installed on the "warm in winter side". This is true for floor insulation as well; vapor barrier is installed up, facing the subfloor.
- the building thermal envelope must be durable sealed to limit infiltration. This is to include the ceiling/attic area.
- check for fit of cutouts and placing of insulating bats around electrical boxes, etc.
- insulate behind tub and shower areas before installing the tub enclosures – these may be hard to get at later
- insulate behind any inaccessible structural framing coverings before securing/nailing and provide for proper air sealing
- insulate the space between a "spaced or open header" before closing off all access
- if basement walls are counted as conditioned space – they must be insulated – these should be inspected before backfill if such insulating method is applied outside.
- for all slab on ground areasboth vertical and horizontal insulating is required
- crawl space areas are treated like basement areas – either the outside walls and space below needs to insulated or the ceiling/floor separating the crawl space from living space requires insulation
- floors must meet the R-value for floors in the certification unless exposed directly to outside air and then floors must meet the R-value for ceilings in the certification
- attic accesses, hatches, scuttles, pull down stairways, etc. must be insulated to the same R-value as the surrounding space. Sealing and weather stripping of these openings are most important.
- any framing, exterior siding material, or the like is not considered as contributing to the insulation values required
- if an alternative method, such as Res-check is used, you must make available the Res-check checklist for your particular building project at the time of inspection.

A permanent certification shall be posted on or about the electrical distribution panel. This certification may be obtained through the Public Utilities Commission at the time of application and certification. Compliance with the NH Energy Code requirement meets a set of minimum performance standards – consider exceeding the code requirements.

The basis for understanding the general code requirements starts with Table 402.1.1 which defines the specific requirements for insulation performance of the building thermal envelope. The table defines the R values and U values required for each assembly of the structure. For instance the table defines the ceiling R-value, floor R-value and wall-cavity R-value for climate zone 5 as being R-38, R30, and R20 respectively.

These values are extracted to the EC-1 Form and proved by the PUC making the requirements easy to interpret. The table specifies insulation R-values. While other building material items may contribute to the nominal R-value only the R-value of the insulation is used to meet the minimum requirements.

Proper understanding of the building thermal envelope is the key to gaining effective performance of the provisions of the energy codes. For instance floor overhangs must be both insulated and sealed against air infiltration. Another area often overlooked is the wall framing for exterior wall placed gas fireplaces. These areas must be treated properly for both insulation value and air infiltration.

The boundaries between conditioned and conditioned spaces are subject to the insulation requirements of Section 402.1.1. The boundaries between the conditioned and unconditioned spaces are subject to infiltration requirements of Section 402.4 These boundaries will include such areas a basement walls of interior stairways to unconditioned basements. Attic access stairways have similar requirements.

The table is important in that all components of the building assembly are subject to these requirements. For instance the fenestration requirements include all doors as well as windows. A single exception is provided for a side-hinged door opaque assembly. This allows for some flexibility for the builder/owner to use an ornate door that is otherwise non-compliant as the main entrance door. This exception may be applied to the doorways abutting unconditioned space (one single door exception) if the exception allowance was not used for the main entrance door. For instance a non-compliant u-factor rated basement door may be allowed or possibly a non-compliant attic access door could be applied for walk-up attics. In all instances on one single door is exempt.

Attic hatches and doors are now required to be both weather-stripped and insulated to the level equivalent to the surrounding areas. For an attic access penetrating an R-38 ceiling; the attic access hatch would need to be insulated to the same R value. The hatch area would be required to be weather-stripped. When loose fill insulation is installed in the ceiling areas around such hatches a wood framed or similar baffle or retainer is required to prevent the degrading of the loose fill insulation surrounding the opening.

A key aspect of the floor insulating is that the insulation must maintain permanent contact with the underside of the subfloor decking above. In floor assemblies utilizing engineered joist system this may require special instructions to the insulators to insure that the insulation is placed high up into the joist in contact with the subfloor. Some mechanism must be established to hold or otherwise keep the insulation in place. Insulation must not drop of otherwise fall out of place overtime. Each spot that this is allowed to happen to negates the R-value of the installed insulation and creates cold spots; even small areas that lack insulation or allow for air flow can have a significant effect on the energy efficiency of the installation.

Air leakage is now a mandatory requirement within the code emphasizing the importance of proper sealing of the building envelope. The air leakage prevents warm conditioned air from leaking out during the heating season and helps prevent hot air from entering during the summer months.

Further air control is required by sealing the entire building thermal envelope from air infiltration. This is the uncontrolled introduction of outside air. This air sealing and insulation must be demonstrated to comply with one of two options. Either by utilizing a testing option or through visual inspection specific to table 402.4.2 are field verified. Compliance to these areas will improve comfort by decreasing cold spots and improve the overall resistance to moisture problems.