



Building Guide ILLOWA Chapter of ICC



International Energy Conservation Code— Prescriptive method

The International Energy Conservation Code is in effect for ALL new structures, additions, renovations or repairs with the following exceptions: **(2009 IECC, 101.4.3)**

1. Storm windows over existing fenestration. (Glass)
2. Replacing the glass only in existing sash and frames.
3. Existing ceiling, wall or floor cavities that are exposed during construction that are already insulated.
4. Construction where the existing roof, wall or floor cavities are not exposed.
5. Reroofs where the sheathing is not removed and the insulation is not exposed.
6. Replacing existing doors does not require a vestibule, existing vestibules cannot be removed.
7. Alterations replacing less than 50% of the lights in a space provided installed interior power is not increased.
8. Alterations that replace existing bulbs and ballasts provided installed interior power is not increased.

* For all other construction projects that involve conditioned space, the requirements of the Energy Code apply.



There are 3 main ways to show compliance with the Energy Code—

1. Complete a Res-Check (see ILLOWA handout “Res-Check- International Energy Conservation Code”)
2. Hire a licensed design professional to fully engineer and certify the project
3. Build to the specific prescriptive requirements for components AND submit a REScheck Package Generator which is available free at www.energycodes.gov. Notes outlining the computations must be included with submittal.

Requirements for option 3 are outlined here. For further information, see Chapter 4 of the 2009 International Energy Code.

WINDOWS— Windows are referred to as “Fenestration”. The MAXIMUM U-factor for fenestrations is 0.35. The U-factor for a window can be found on the window sticker. This sticker must NOT BE REMOVED from the window until after the inspector has approved removal. Skylights are allowed a maximum U-factor of 60. **(2009 IECC, TABLE 402.1.1)**

Window sticker showing U-factor

| | |
|---------------------------------------|-----------------------------|
| ENERGY PERFORMANCE RATINGS | |
| U-Factor (U.S./I-P) | Solar Heat Gain Coefficient |
| 0.35 | 0.32 |
| ADDITIONAL PERFORMANCE RATINGS | |
| Visible Transmittance | Air Leakage (U.S./I-P) |
| 0.51 | 0.2 |
| Condensation Resistance | |
| 51 | — |

Manufacturer disclaimer: These ratings conform to applicable NFRC procedures for determining window performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not warrant any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

CEILINGS— Ceilings must be insulated with a minimum of R-38. Using energy trusses allows for certain reductions. **(2009 IECC 402.2.1)** If insulated with cellulose (blown) insulation, rulers must be placed every 300 sq ft with the depth of the insulation shown and facing the scuttle hole so the inspector can verify the depth. Spray foam insulation installers must place a sticker showing compliance with the required R value in the electrical panel. Scuttle holes must be sealed and be insulated the same as the ceiling. **(2009 IECC 402.2.3)**

WOOD FRAMED WALLS— The code requirements for wood frame walls are R-20, or R-13/5. R-value is based on the insulation and other building materials are NOT to be used in the calculation. **(2009 IECC 402.1.2)** If using 2X4 walls, R-13 cavity insulation can be used PLUS R-5 exterior sheathing. If more than 25% of the exterior is covered by structural sheathing, the structural sheathing must be supplemented with insulation of at least R-2. If structural sheathing covers less than 25% of the exterior area, no additional insulation is required. **(2009 IECC Table 402.1 footnote h)**

Insulation depth gauge— required every 300 square feet in attic

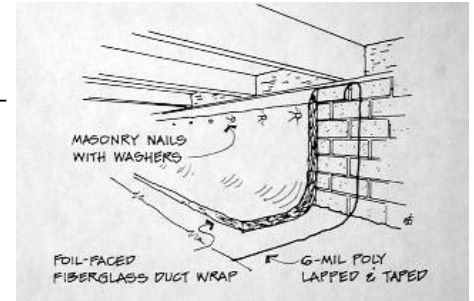


2009 IECC 402.4.1 requires that all sources of air infiltration in the Building Thermal Envelope to be sealed. This includes all seams, joints, penetrations, rim joist junctions, openings between window/door jams and walls, sill plates, knee walls, outlet openings, switches and lighting that is placed in a wall separating conditioned and unconditioned spaces.

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FLOORS: Where a floor covers any unconditioned space, it must have R30 OR insulation sufficient to completely fill the framing cavity, R19 minimum. **(2009 IECC Table 402.1.1, footnote g)**

CRAWLSPACES— as an alternative to insulating the floor an unvented crawl space may have the same application as basement walls provided the insulation shall be permanently attached to the wall and extend downward from the floor above to grade and then vertically or horizontally for at least 24 inches. The International Residential Code requires exposed earth to have a class 1 vapor retarder. **(2009 IECC 402.2.9)**



Interior Crawl Space Insulation



Studded Basement Wall R-13 Cavity Insulation and R-5 foam backer

BASEMENT WALLS— Basement walls may have either R-10 continuous insulated sheathing on the interior or exterior of the basement walls installed per the Manufacturers Instructions for the application, or R-13 cavity insulation on the interior walls— as in a normally finished basement. If the manufacturer does not list the product for the application, it cannot be used. Insulation must extend from the top of the basement wall to 10 feet below finished grade OR to the floor, whichever is less. **(2009 IECC 402.2.7)**

*** Insulation on the exterior of walls and slabs must have a rigid, opaque and weather resistant covering to protect it from degradation of the thermal performance and it must extend down 6 inches below finished grade.

(2009 IECC 303.2.1)

SLAB- The most common area for required slab insulation is on walkout

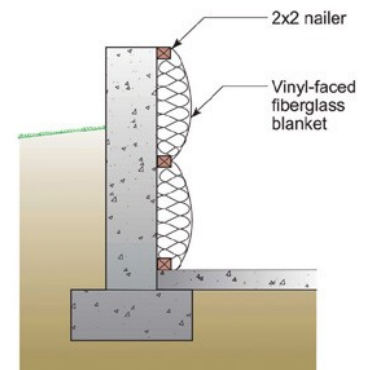
basements where the concrete floor is at or near grade. The slab is required to have R-10 on the outside to the top of the concrete, and down 2 ft below finished grade. Heated slabs are required to be R-15. **(2009 IECC Table 402.1.1, footnote d)**

Ducts— Supply ducts in attics shall be insulated to a minimum of R-8, all other ducts must be insulated to R-6 unless located COMPLETELY within the Building Thermal Envelope. All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed to comply with M1601.4.1 of the International Mechanical Code. **(2009 IECC 403.2.2)** Building cavities may NOT be used for supply side ducts. Ducts shall NOT displace required insulation.

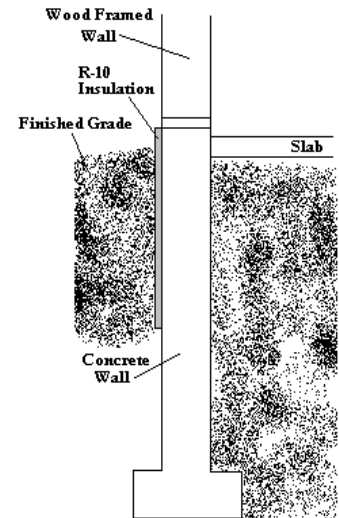
Fireplaces— Wood-burning fireplaces SHALL have gasketed doors and outdoor combustion air. **(2009 IECC 402.4.3)**

Lighting— At least 50% of bulbs in permanent light fixtures shall be high efficacy lamps. **(2009 IECC 404.1)**

Doors- Different types of doors have different U-value requirements. **(2009 IECC 303.1.3 (2))** When filling out the RE-Scheck Product Generator, fill in the U-factor for your specific doors and include the catalogue section from the manufacturer showing the information with the list of materials as part of the construction documents. (Doors with over 50% glass are considered FENESTRATIONS so count them with windows.)



Continuous Interior R-10 Blanket Insulation in Basement



R-10 Slab insulation 2 ft in depth

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