

2009 INTERNATIONAL ENERGY CONSERVATION CODE

Proposed Amendment Notes

ADMINISTRATION

SECTION RBC308 - ENERGY CONSERVATION CODE

Chapter 1.

This chapter addresses the administration of the IECC. The first 4 RBC sections are necessary in order to adopt the code. They have little to no technical merit and do not affect how the code is applied.

Under the 2005 RBC Section RBC301.4.1 amended the 2003 IECC to eliminate the requirement for the Building Official to certify that when the occupancy of a building is changed that the new occupancy would not result in an increase in fossil fuel consumption. This not a feasible requirement as the new use may have an increase in energy use but still be code compliant. This amendment has been removed from the 2011 RBC as this requirement is not contained in the 2009 IECC. The 2009 IECC requires the new occupancy or use to meet IECC requirements.

101.4.3 *Exception 5 as written requires insulation to be upgraded or code complaint when a reroof permit is issued as the IRC requires all layers of roofing to be removed, exposing the deck. Exception 5 conflicts with Exception 4 as Exception 4 requires the insulation to be code complaint with the insulation is exposed (i.e. decking removed). It would be very cost prohibitive to require insulation to be upgraded at a reroof permit. This would require the homeowner to hire a roofing contractor and insulation contractor for a simple reroof.*

The 2003 IECC contains a provision that RBD has interpreted to exclude structures accessory to one and two family dwellings from energy code criteria. The 2009 IECC

does not contain this language. This exception is intended to apply to detached garages and similar uses that may be heated but the primary use is not for human occupancy. Locally this is an issue, especially when heat is added to an existing unheated detached garage. If compliance with the IECC is required foundation insulation must be added. This is not cost effective or feasible for a detached garage.

103. *Un-amended the 2009 IECC requires all information submitted for permit to be stamped by a design professional. The RBC amended the 2003 IECC to not require a stamp for residential construction. The 2009 IECC simplifies residential construction and therefore a design professional should not be required for Chapter 4 requirements. The exception is section 405 which is complex and is performance based. Commercial projects require a stamp for energy compliance and this is consistent with the remainder of the construction documents. The second amendment to this section deleting the second exception is no longer necessary as it is no longer contained in the 2009 IECC.*

This amendment was revised to replace the entire Section 103 as it now contains duplication of language in the administration section of the RBC.

107, 108, 109 *The 2009 IECC has also added three new sections that address Fees, Stop Work Orders, and a Board of Appeals. These activities are covered under the RBC and because of minor inconsistencies and duplication of information these sections should be deleted in the 2009 IECC.*

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DEFINITIONS

Chapter 2.

The 2005 RBC amends 201.3 to address the definition of terms in this code and others. This amendment is no longer needed as the

2009 IECC makes reference to all applicable codes. No amendments to Chapter 2 are proposed.

CLIMATE ZONES

Chapter 3.

Chapter 3 of the 2009 IECC addresses Climate Zones. Per Table 301.1 El Paso

County is Zone 5B. No amendments are proposed for Chapter 3

RESIDENTIAL ENERGY EFFICIENCY

Chapter 4.

This chapter addresses the energy efficiency of Residential Buildings. Per the definition of Residential Buildings this chapter applies to R-2, R-3, R-4 and dwellings constructed under the IRC. It does not apply to R-1 occupancies. The 2003 IECC contains different provisions depending on the type of project. Following is a commentary of Chapter 4 and four proposed amendments to the 2009 IECC. The 2005 RBC contains a total of 38 amendments to the 2003 IECC.

402.1 *This section specifies the minimum insulation values for each component of the home. There is no limit on the amount of glazing; you must only meet the minimum R and U values. The R and U values can be accomplished rather easily with the exception of the wood framed wall criteria. If the structure meets the prescriptive requirements of Table 402.1 there is no need to use RES check. For homes that do not meet the prescriptive requirements RES check is an option but will likely produce more stringent requirements. Propose the following:*

This amendment serves two purposes:

- It permits the use of conventional R-19 batt 2x6 construction as well as R-15 batt 2x4 construction provided the structure is continuously sheathed. The*

reduction of R-20 to R-19 is very minor and continues to allow common conventional construction. The change from 13+5 to 15+2 is a overall reduction of R-2 but continues to allow conventional construction. R-15 batts are available for 2x4 construction but this is a added cost. The added cost of R-15 is less than the cost of continuous R-5 insulated sheathing. The overall R value of R-17 also falls in line with Table 402.1.3 which requires the assembly to have an R value of 17.54. If Table 402.1.3 is used the R value of construction materials may be accounted for whereas 402.1.2 does not allow for these materials to be accounted for when Table 402.1.1 is used. Per ASHRAE standards ½" drywall and structural sheathing results in an overall R value of approximately R-3. Thus if Table 402.1.3 is used the wall could be constructed with R-15 batts and no insulated sheathing and exceed the R-17.54 requirement. The proposed amendment simply applies this logic to Table 402.1.1.

- The provision for continuous sheathing simplifies the wall bracing requirements of the IRC as well as increases the current standard.*

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TABLE 402.1.1 2009 IECC

Insulation and Fenestration Requirements by Component

Table reflects proposed amendments

| Climate Zone | Fenestration U-Factor ^b | Skylight U-Factor ^b | Glazed Fenestration U-Factor ^{b,e} | Ceiling R-Value | Wood Framed Wall R-Value | Mass Wall R-Value ⁱ | Floor R-Value | Basement ^c Wall R-Value | Slab ^d R-Value & Depth | Crawl Space ^c Wall R-Value |
|----------------|------------------------------------|--------------------------------|---------------------------------------------|-----------------|--------------------------|--------------------------------|-----------------|------------------------------------|-----------------------------------|---------------------------------------|
| 5 and Marine 4 | 0.35 | 0.60 | NR | 38 | 19 or 15+2 ^h | 13/17 | 30 ^g | 10/13 | 10, 2ft | 10/13 |

h. "15+2" means R-15 cavity insulation plus R-2 insulated sheathing. If the building is continuously sheathed with structural panels insulated sheathing may be omitted.

Table 402.1.1 of the 2009 IECC does not place a limit on the amount of glazing in the residence. The 2003 IECC contains similar prescriptive requirements but the R and U values are dependent upon the percentage of glazing in the exterior walls. It should also be noted that that overall the R and U Values are LESS restrictive in the 2009 IECC

than they are in the 2003 IECC (as amended by the RBC). This is likely due to the increased air sealing criteria in the 2009 IECC. Note that footnote "g" permits the floor R Value to be reduced to a minimum of R-19 provided the insulation fills the cavity and maintains contact with the subfloor per 402.2.6.

TABLE 502.2.4(1-6) 2003 IECC as amended

| Window Area Percentage of Gross Exterior Wall | Maximum | Minimum | | | | | |
|-----------------------------------------------|------------------|-----------------|-----------------------|---------------|------------------|------------------------|--------------------------|
| | Glazing U-Factor | Ceiling R-Value | Exterior Wall R-Value | Floor R-Value | Basement R-Value | Slab Perimeter R-Value | Crawl Space wall R-Value |
| 8% | 0.45 | R-38 | R-13 | R-19 | R-10 | R-5, 3ft | R-16 |
| 12% | 0.40 | R-38 | R-13 | R-19 | R-10 | R-5, 3ft | R-16 |
| 15% | 0.35 | R-38 | R-13 | R-21 | R-10 | R-5, 3ft | R-20 |
| 18% | 0.34 | R-49 | R-22 | R-19 | R-10 | R-8, 3ft | R-17 |
| 20% | 0.31 | R-49 | R-24 | R-19 | R-10 | R-7, 3ft | R-17 |
| 25% | 0.25 | R-49 | R-19 | R-21 | R-10 | R-19, 3ft | R-20 |

402.1.4 *This section allows for an alternative approach to the prescriptive requirements. This method uses a Total UA approach and may be used if a specific component does not meet the prescriptive requirements. Note that section 402.1.2 does not allow building components such as drywall to be included in the minimum R-Value requirements of Table 402.1.1 but does not exclude this approach if Table 402.1.3 is used.*

There are two options in this section; each individual component may meet the requirements of Table 402.1.3 or the entire building may be calculated in accordance with 402.1.4. Should the building not meet the requirements of Table 402.1.1 or 402.1.3 the total UA approach may be the next logical choice.

402.2.1. *If the R value of the attic insulation is continuous from exterior wall to*

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exterior wall (energy heal trusses) the required R-38 may be reduced to R-30.

402.2.3. This section requires doors and hatches between conditioned and unconditioned space to be weather-stripped and insulated.

402.2.5. This section addresses steel framing used in ceiling, walls, and floor. Because of the cold bridge created with steel framing the 2009 IECC requires the R-Values in these assemblies be increased in accordance with Table 402.2.5.

402.2.7. This section requires basement wall be insulated to a depth of 10' below grade or to the basement floor, whichever is less. If the basement has a structural floor with a crawlspace below this section could provide relief for insulation below the floor.

402.2.9. This section may present a unique issue for builders and inspection staff. If the bottom of a conditioned crawlspace is less than 24" from exterior grade the insulation must be extended horizontally. This does not apply to unconditioned crawl spaces in which the floor assembly is insulated.

Additionally, 402.2.9 requires a Class I vapor retarder as well as extensive requirements for sealing of the vapor retarder. This same requirement was reviewed in the 2009 IRC and the group proposed an amendment due to difficulty of construction and sealing requirements. The 2009 IRC along with the proposed amendments does require a Class I vapor retarder but eliminates the sealing criteria. For the most part El Paso County is relatively dry and the sealing criteria of the vapor retarder require the vapor barrier be seal to the foundation wall. This must be accomplished prior to wall insulation and will likely result in a damaged vapor retarder.

This section of the IECC should be modified or the proposed amendment to the IRC should be removed for consistency. Propose the following:

402.2.11. Thermally isolated Sunrooms have been simplified in the 2009 IECC. Ceilings must be a minimum of R-24, walls R-13 with no criteria for fenestration.

402.3.1. This section allows for a weighted average for door and window U values. Thus, not all doors and windows must meet the 0.35 value provided others can make up for the difference.

402.3.3. and 402.3.4. These sections allow for a certain area of door and windows to be excluded from the minimum U value requirement.

402.3.6. This section requires replacement windows and doors to meet IECC criteria. This could imply that a building permit is required for window replacement but RBC105.2 would need to be modified.

402.4.2. This section addresses air sealing of the building. Two options are provided, a testing option (blower door test) and a visual inspection option. If the 1st option used the building department would be presented 3rd party documentation for the test. If the second option is used 3rd party verification may be an option but if RBD was to inspect the items listed on Table 402.4.2 it could be cost prohibitive for RBD.

402.2.1. This section requires all ducts to be insulated to a minimum R-6 or R-8 but provides an exception that eliminates insulation for duct work inside the thermal envelope.

403.2.2. Because adoption of the 2009 IRC is not proposed to include Section M1601 the following amendment corrects the code reference to appropriate section in the 2009 IMC.

403.2.3. This section does not permit building framing cavities to be used for supply "ducts". The IMC does not permit "plenums" to be used for supply air. It is RBD's interpretation that the intent of section 403.2.3 is the same as the IMC and does not permit framing cavities to be used as supply plenums. Section 403.2.3 does not apply to ducts located in framing cavities. If the duct is inside the thermal envelope but located in a framing cavity (i.e. insulation on cold side of duct work) the duct would not require additional insulation per 402.1.1.

403.3. This section requires mechanical system piping to be insulated to a minimum

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of R-3 but does NOT provide for the same exception as 402.2.1. Propose the following:

403.4. *This section requires hot water circulating systems to be insulated to a minimum of R-2. It also requires an automatic or readily accessible manual switch to turn off the circulating pump when not in use. The 2005 RBC adds an exception that eliminates the insulation provided a timer is installed. This section of the IECC provides no relief for piping inside the thermal envelope. Propose the following:*

403.6. *Chapter 14 of the 2009 IRC is not scheduled for adoption therefore this section of the IECC would reference a section of the code that does not exist. The amendment simply takes the language contained in section M1401.3 of the IRC and moves it into the IECC.*