



PUBLIC CODE CHANGE PROPOSAL FORM FOR PUBLIC PROPOSALS IN THE INTERNATIONAL CODES

2007/2008 CODE DEVELOPMENT CYCLE

CLOSING DATE: All Proposals Must Be Received by August 20, 2007

The 2007/2008 Code Development Hearings are tentatively scheduled for
February 18 – March 2, 2008, location TBD.

- 1) **Name:** Ronald Majette **Date:** August 19, 2007
Jurisdiction/Company: U.S. Department of Energy
Submitted on Behalf of: U.S. Department of Energy
Address: 1000 Independence Avenue, EE-2J, IJ-018
- City:** Washington D.C. **State:** DC **Zip Code:** 20585
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- 2) **Copyright Release:** In accordance with Council Policy #28 Code Development, all Code Change Proposals, Floor Modifications and Public Comments are required to include a copyright release. A copy of the copyright release form is included at the end of this form. Please follow the directions on the form. This form as well as an alternative release form can also be downloaded from the ICC website at www.iccsafe.org. If you have previously executed the copyright release, please check the box below:

X 2007/2008 Cycle copyright release on file

- 3) Indicate appropriate International Code(s) associated with this Public Proposal – Please use Acronym: IECC and IRC
If you have also submitted a separate coordination change to another I-Code, please indicate the code: _____
(See section below for list of names and acronyms for the International Codes).

- 4) **Be sure to format your proposal and include all information as indicated on Page 2 of this form.**

- 5) Proposals should be sent to the following offices via regular mail or email. An e-mail submittal is preferred, including an electronic version, in either Wordperfect or Word. The only formatting that is needed is **BOLDING, STRIKEOUT AND UNDERLINING**. Please do not provide additional formatting such as tabs, columns, etc., as this will be done by ICC. **REMOVE TRACKING CHANGES, AUTOMATIC NUMBERING, OR ANY OTHER ADVANCED FORMATTING TOOLS THAT ARE PROVIDED BY WORD, FROM FILES CONTAINING YOUR CODE CHANGE PROPOSAL THAT YOU SEND TO ICC.**

Please use a separate form for each proposal submitted. Note: All code changes received will receive an acknowledgment.

Please check here if separate graphic file provided.

Graphic materials (Graphs, maps, drawings, charts, photographs, etc.) must be submitted as separate electronic files in .CDR, .IA, .TIF or .JPG format (300 DPI Minimum resolution; 600 DPI or more preferred) even though they may also be embedded in your Word or Wordperfect submittal.

Code

- IBC - International Building Code
- IEBC - International Existing Building Code
- IFC - International Fire Code
- IFGC - International Fuel Gas Code
- IPC - International Plumbing Code
- IPSDC - International Private Sewage Disposal Code
- IPMC - International Property Maintenance Code
- IWUIC - International Wildland-Urban Interface Code
- IZC - International Zoning Code
- ELECT - International Code Council Electrical Code– Administrative Provisions

Send to:

International Code Council
Chicago District Office
Attn: Diane Schoonover
4051 West Flossmoor Road
Country Club Hills, IL 60478-5795
Fax: 708/799-0320
codechanges@iccsafe.org

- IECC - International Energy Conservation Code
- ICC PC - ICC Performance Code
- IMC - International Mechanical Code
- IRC - International Residential Code

International Code Council
Birmingham District Office
Attn: Annette Sundberg
900 Montclair Road
Birmingham, AL 35213-1206
Fax: 205/592-7001
codechangesbhm@iccsafe.org

CODE CHANGE PROPOSAL

Please provide all of the following items in your code change proposal. Your proposal may be entered on the following form, or you may attach a separate file. However, please read the instructions provided for each part of the code change proposal. The sections identified in parentheses are the applicable sections from CP #28 Code Development. The full procedures can be downloaded from www.iccsafe.org.

Code Sections/Tables/Figures Proposed for Revision (3.3.2): IECC Table 402.1.1 and Table 402.1.3. IRC Table N1102.1 and Table N1102.1.2.

Note: If the proposal is for a new section, indicate (new).

Name/Company/Representing (3.3.1): Ronald Majette / U.S. Department of Energy

Note: You must indicate your name and the full name of who you are representing. Do not use acronyms.

Proposal: NOTE: PLEASE READ ITEM 5) of the first page of this form for formatting instructions.

IECC:

Revise as follows:

Table 402.1.1 Insulation and Fenestration Requirements by Component^(a)

Climate Zone	Fenestration U-Factor	Skylight ^(b) U-Factor	Glazed Fenestration SHGC	Ceiling R-Value	Wood Frame Wall R-Value	Mass Wall R-Value ^(h)	Floor R-Value	Basement ^(c) Wall R-Value	Slab ^(d) R-Value & Depth	Crawl Space ^(c) Wall R-Value
1	1.20	0.75	0.40	30	13	3/4	13	0	0	0
2	0.75	0.75	0.40	30	13	4/6	13	0	0	0
3	0.65	0.65	0.40 ^(e)	30	13	5/8	19	0 5/13 ^(f)	0	5/13
4 except Marine	0.40	0.60	NR	38	13	5/10	19	10 / 13	10, 2 ft	10 / 13
5 and Marine 4	0.35	0.60	NR	38	19 or 13+5 ^(g)	13/17	30 ^(f)	10 / 13	10, 2 ft	10 / 13
6	0.35	0.60	NR	49	19 or 13+5 ^(g)	15/19	30 ^(f)	10 / 13	10, 4 ft	10 / 13
7 and 8	0.35	0.60	NR	49	21	19/21	30 ^(f)	10 / 13	10, 4 ft	10 / 13

f. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.
 Renumber following footnotes accordingly.
 Remainder of table unchanged.

Table 402.1.3. Equivalent U-Factors^(a)

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor ^(b)	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.75	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.65	0.65	0.035	0.082	0.141	0.047	0.360 0.091 ^(c)	0.136
4 except Marine	0.40	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.060	0.082	0.037	0.059	0.065
6	0.35	0.60	0.026	0.060	0.060	0.033	0.059	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	0.059	0.065

- (a) Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.
- (b) When more than half the insulation is on the interior, the mass wall U-factors shall be 0.17 in zone 1, 0.14 in zone 2, 0.12 in zone 3, 0.10 in zone 4, and the same as the wood frame wall in zones 5 through 8.
- (c) Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure 301.1 and Table 301.2.

Remainder of table unchanged.

IRC:

Revise as follows:

Table N1102.1 Insulation and Fenestration Requirements by Component^(a)

Climate Zone	Fenestration U-Factor	Skylight ^(b) U-Factor	Glazed Fenestration SHGC	Ceiling R-Value	Wood Frame Wall R-Value	Mass Wall R-Value	Floor R-Value	Basement ^(c) Wall R-Value	Slab ^(d) R-Value & Depth	Crawl Space ^(e) Wall R-Value
1	1.20	0.75	0.40	30	13	3	13	0	0	0
2	0.75	0.75	0.40	30	13	4	13	0	0	0
3	0.65	0.65	0.40 ^(e)	30	13	5	19	0 <u>5/13^(f)</u>	0	5/13
4 except Marine	0.40	0.60	NR	38	13	5	19	10 / 13	10, 2 ft	10 / 13
5 and Marine 4	0.35	0.60	NR	38	19 or 13+5 ^(g)	13	30 ^(f)	10 / 13	10, 2 ft	10 / 13
6	0.35	0.60	NR	49	19 or 13+5 ^(g)	15	30 ^(f)	10 / 13	10, 4 ft	10 / 13
7 and 8	0.35	0.60	NR	49	21	19	30 ^(f)	10 / 13	10, 4 ft	10 / 13

- f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.2 and Table N1101.2.

Renumber following footnotes accordingly.

Remainder of table unchanged.

Table N1102.1.2. Equivalent U-Factors^(a)

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.75	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.65	0.65	0.035	0.082	0.141	0.047	0.360 <u>0.091^(b)</u>	0.136
4 except Marine	0.40	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.060	0.082	0.037	0.059	0.065
6	0.35	0.60	0.026	0.060	0.060	0.033	0.059	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	0.059	0.065

- (a) Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.

- (b) Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure N1101.2 and Table N1101.2.

Supporting Information (3.3.4 & 3.4):

The purpose of this proposal is to add basement wall insulation requirements for the colder regions of climate zone 3. Currently, no insulation is required for conditioned basements (floor insulation is required over unconditioned basements) in Zone 3. Though basements are uncommon in Zone 3, there are some and they tend to be in the colder parts of the zone where winter temperatures can reach as low as single digits. When basements are used as a conditioned living space, they often have furred in walls that allow space for insulation.

Energy simulation analyses shows that foundation wall insulation in cold climates is cost effective. For conditioned basements, the Building Foundation Design Handbook reports that R-5 insulation wall insulation 8 ft. deep saves 0.16 MBtu/lineal foot of foundation perimeter of heating energy use compared to an uninsulated wall in Atlanta. Assuming a house with a 130 ft. perimeter basement, this is 20.8 MBtus a year. Assuming \$10/MBtu natural gas cost, this insulation will save \$208 a year in heating costs. For example, with the NAHB estimated insulation cost of \$990 (EC42-06/07 Public Comment), the simple payback will be in about five years in Atlanta. The lost floor space from insulating basement walls should be minimal as conditioned basements are normally finished, and exterior insulation is an option. On the cooling side, the Building Foundation Design Handbook reports that R-5 insulation wall insulation 8 ft. deep saves a modest 0.12 kWh/lineal foot of foundation perimeter of heating energy use compared to an uninsulated wall in Atlanta. For a house with the 130 ft. perimeter, this is a savings of 15.6 kWh, or a little over a dollar at typical electricity prices. A basement with insulated walls will still benefit from cool summer temperatures of the deep earth because the entire basement floor will be in direct contact with the earth.

This proposal has an important improvement over a similar proposal in the 06/07 code change cycle. A compliant about the proposal in the last cycle was that zone 3 had very mild climate, particularly in the southern areas of zone 3. This new proposal exempts the “warm-humid” region of zone 3 from basement wall insulation, which includes about half of zone 3 in the eastern U.S. Therefore, basement wall insulation would only be required in the areas where basement wall insulation makes the most sense-the colder areas.

It is important to understand the insulation options for basements currently in the IECC and IRC contain a perverse incentive. Consider two houses with basements that are identical in all ways but one has a conditioned basement and the other has an unconditioned basement. Which will use more energy? Clearly, the one with a conditioned basement. Therefore, logically the envelope of the house with a conditioned basement should be at least as well insulated than the house with an unconditioned basement. However, in climate zone 3 the IECC requires R-19 insulation in the ceiling above an unconditioned basement whereas a conditioned basement is not required to have any insulation at all in either the ceiling or walls of the basement. In terms of reducing construction costs, it is to the builders economic advantage to build a “conditioned” basement, which will raise energy use.

Furthermore, under the IECC’s definitions, a basement will be a “conditioned space” simply if ducts in the basement are not insulated. It is not even necessary to install registers or otherwise provide a heating or cooling source. Therefore the builder can not only eliminate basement ceiling insulation but also not insulate the ducts, both of which will substantially increase energy use. This is in conflict with the IECC’s intent for the “effective use of energy”. The IECC allows trade-offs where the energy efficiency of one measure can be reduced below code if a compensating improvement is made to another measure. In this case, a reduction in energy efficiency (removing basement ceiling insulation) not only allows absolutely no compensating improvement, but illogically allows yet another reduction in efficiency (removal of duct insulation).

Referenced Standards (3.4 & 3.6):

Cost Impact (3.3.4.6):

The code change proposal will increase the cost of construction.