Review of Comments Submitted to SECO on Chapter 11, 2012 IRC & 2012 IECC

ATTACHMENT B

Analysis of Suggested Amendments

This attachment contains the stringency analysis of the suggested amendments to the 2012 IRC or the 2012 IECC energy efficiency provisions for single-family residences, in comparison to the Texas Building Energy Performance Standards (TBEPS), which are based on Chapter 11 of the 2009 IRC and Chapter 4 of the 2009 IECC. Each analysis was performed using a base-case single-family house that complies with Chapter 11 of the 2012 IRC and Chapter 4[RE] of the 2012 IECC with the suggested amendment vs. a TBEPS code-compliant base-case house. The analysis was performed for each of the suggested amendments separately and therefore does not represent the impact of implementing combinations of the suggested amendments.

No.	Suggested Amendment - Synopsis	Commenter	Laboratory's Stringency Analysis[1]
B-1	Modifications to Chapter 11, N1102.2.2, 2012 IRC and to Section R402.2.2, 2012 IECC – When the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, a reduction of insulation is allowed for up to 500 square feet or 20% of the total insulated ceiling area, whichever is less. This suggested amendment removes the 20% limit. *(See TAB Suggestion B-1, pgs. B.7 - B.8, for details and reason)*	Texas Association of Builders (TAB) [2]	**The suggested amendment is as stringent as the TBEPS.** *(See Analysis B-1, pgs. B.3 - B.4, for results of the Laboratory's analysis)* Note: The suggested amendment is as stringent as the published 2012 code.
B-2	Modifications to Tables N1102.1.1 and N1102.1.3, 2012 IRC, and Table R402.1.1 and R402.1.3, 2012 IECC – This suggested amendment reverts to the 2006 codes basement wall R-value and U-value in Climate Zones 6, 7 and 8. *(See TAB Suggestion B-2, pgs. B.9 - B.12, for details and reason)*	TAB	**The suggested amendment is as stringent as the TBEPS since it proposes changes to climate zones that fall outside of Texas.** Note: The suggested amendment is as stringent as the published 2012 code.
B-3	Modifications to Table N1105.5.2(1), 2012 IRC, and Table R405.5.2 (1), 2012 IECC – The 2006 IECC allowed for the trade-off of more efficient HVAC equipment with building envelope requirements to demonstrate code compliance when using the performance method. The 2009 and 2012 IECC and the 2012 IRC have removed that provision; this amendment suggests reinstating the trade-off option. *(See TAB Suggestion B-3, pgs. B.13 - B.16, for details and reason)*	TAB	**The stringency of the suggested amendment can only be assessed using specific trade-off measures on a case by case basis.** Note: The 2009 IECC and the 2012 IECC and IRC do not allow trade-offs between equipment and building thermal envelope.

[1] Section N1101.2 of the 2009 IRC requires that compliance shall be demonstrated by either meeting the 2009 IECC or meeting the requirements of the 2009 IRC. Compliance with the performance path as described in the 2009 IECC was adopted for this analysis.

[2] All suggested amendments submitted by the Texas Association of Builders (TAB) were developed by the National Association of Home Builders (NAHB).

No.	Suggested Amendment - Synopsis	Proposer	Laboratory's Stringency Analysis
B-4	Modifications to Tables N1102.1.1 and N1102.1.3, 2012 IRC, and Tables R402.1.1 and R402.1.3, 2012 IECC – This suggested amendment reverts to the 2009 code insulation R-values for walls with wood frame construction. *(See TAB Suggestion B-4, pgs. B.17 - B.20, for details and reason)*	TAB	**The suggested amendment is as stringent as the TBEPS[3].** *(See Analysis B-4, pg. B.5, for results of the Laboratory's analysis)* Note: The suggested amendment is less stringent than the published 2012 code. Depending on the climate zone and the type of heating system, the suggested amendment is 3% to 4% less stringent than the 2012 code.
B-5	Modifications to N1103.2.2, 2012 IRC – The code requires that duct tightness be tested either post-construction or at the rough-in stage. This suggested amendment removes the option for post-construction tests for duct leakage. *(See TAB Suggestion B-5, pg. B.21, for details and reason)*	TAB	**The suggested amendment is as stringent as the TBEPS.** The suggested amendment addresses the issue of the stage/timing of testing for duct leakage. It does not discuss the extent of the leakage. Note: The suggested amendment is as stringent as the published 2012 code.
B-6	Modifications to N1103.2.3, 2012 IRC and R403.2.3, 2012 IECC – The 2009 code allows using building cavities for return air, and prohibits their use for supply air. The 2012 code does not allow the use of building cavities as ducts or plenums for supply or return. This suggested amendment reintroduces the language that includes the use of building cavities as return ducts. *(See TAB Suggestion B-6, pg. B.22, for details and reason)*	TAB	**The suggested amendment is as stringent as the TBEPS.** Both the 2009 IRC (Section N1103.2.3) and the 2009 IECC (Section 403.2.3) allow the use of cavities as return ducts. Therefore, this suggested amendment is as stringent as the TBEPS. Note: The suggested amendment is as stringent as the published 2012 code, provided that the specifications of the building cavity are equivalent to those of a code-compliant return air duct as specified in Sections R403.2.1 and R403.2.2 of the 2012 IECC.
B-7	Modifications to Table R402.1.1 and Table R402.1.3, 2012 IECC – This suggested amendment reverts to the 2006 code Solar Heat Gain Coefficient (SHGC). *(See TAB Suggestion B-7, pg. B.23, for details and reason)*	TAB	**The suggested amendment is as stringent as the TBEPS[3].** *(See Analysis B-7, pg. B.6, for results of the Laboratory's analysis)* Note: The suggested amendment is less stringent than the published 2012 code. Depending on the climate zone and the type of heating system, the suggested amendment is 5% to 7% less stringent than the 2012 code.
B-8	A modification to Section R403.5, 2012 IECC – This suggested amendment adds the IRC requirements for specifications of mechanical ventilation systems for dwellings from Section M1507, 2012 IRC to Section R403.5, 2012 IECC. *(See Newport Suggestion B-8, pgs. B.24 - B.30, for details and reason)*	Newport Ventures	**The suggested amendment is as stringent as the TBEPS.** The suggested amendment adds code language to the 2012 IECC from the 2012 IRC to provide consistency and clarity. Note: The suggested amendment is as stringent as the published 2012 code.

[3] The suggested amendment also proposes changes to climate zones that fall outside of Texas. Analysis for these climate zones is not part of TBEPS.

Analysis B-1

This analysis was performed to evaluate the suggested amendment to modify Chapter 11, N1102.2.2, 2012 IRC and Section R402.2.2, 2012 IECC by removing the 20% limit for reduced ceiling R-value when considering ceilings without attics. For this analysis, a weighted average of the ceiling insulation was compared for 10 different house sizes. One half of the ceiling area of each house was modeled as being under an attic and the remaining ceiling was modeled as a cathedral ceiling. As suggested by the amendment, the weighted average for the test house was obtained by implementing a reduced ceiling insulation of R-30 to 500 ft^2 of ceiling area regardless of the house size. This was compared to a corresponding TBEPS compliant base-case house with a weighted average of ceiling insulation as prescribed by Section 402.2.2 of the 2009 IECC. The analysis was performed for the three climate zones of Texas as described in the TBEPS.

Table B-1 presents the difference in annual source energy consumption from implementing reduced ceiling R-values to 500 ft^2 of ceiling area of a 2012 IECC compliant test-case when compared to the energy consumption obtained from the TBEPS compliant base-case. The suggested amendment is more stringent than the TBEPS compliant base-case.

Table B-1: Comparing Annual Energy Consumption for 2012 IECC Compliant Test-Case Implementing Reduced Ceiling R-values to 500 ft^2 of Ceiling Area with the TBEPS Compliant Base-Case

County	2009 IECC Climate Zones	House Size (ft^2)	% Difference in Total Energy Consumption (2009 IECC Source) Positive values indicate increase in stringency	
			Gas Heating, Gas Domestic Hot Water (DHW)	Heat Pump Heating, Electric Domestic Hot Water (DHW)
Harris	2	1600	19%	16%
		1800	19%	15%
		2000	18%	15%
		2200	18%	15%
		2400	18%	14%
		2600	17%	14%
		2800	17%	13%
		3000	17%	13%
		3200	17%	14%
		3400	17%	13%
Tarrant	3	1600	20%	16%
		1800	20%	16%
		2000	20%	17%
		2200	21%	16%
		2400	21%	16%
		2600	21%	17%
		2800	22%	17%
		3000	22%	17%
		3200	22%	17%
		3400	23%	18%
Potter	4	1600	8%	6%
		1800	8%	6%
		2000	9%	7%
		2200	10%	7%
		2400	10%	8%
		2600	11%	8%
		2800	11%	9%
		3000	12%	9%
		3200	12%	10%
		3400	13%	11%

Notes:

1. Percent Difference in Total Energy Consumption:
   [Base-case energy consumption (2009 IECC) – Test-case energy consumption (2012 IECC 500 ft^2 reduced insulation)] / Base-case energy consumption (2009 IECC) %.
2. This analysis used the performance path approach to show compliance with 2009 IECC.
3. Base-case Simulation Assumptions:
   Analysis used a 2,325 ft2 single-family house, single-story, four bedrooms, slab-on-grade, ducts in the conditioned, ventilated attic, window-to floor ratio: 15%, windows equally distributed (N,E,S,W) with no exterior shading. All other roof, wall and window parameters were modeled as per specifications in Chapter 4 of the 2009 IECC for the counties shown. Two base-case buildings were considered: Natural gas space heating and DHW, and heat-pump space heating and electric DHW.
4. 2009 IECC Source Energy:
   As per Section 405.1 of the 2009 IECC, compliance with the 2009 code is established using heating, cooling, and service water heating only. As per Section 405.3 of the 2009 IECC, a factor of 3.16 is used to calculate the source energy generation for electricity consumption and a factor of 1.1 was used to calculate source energy generation for natural gas consumption.
5. For this case, one half of the ceiling area above the conditioned floor area of the house was modeled under an attic. The remaining half was modeled as a cathedral ceiling. As per the 2009 IECC, reduced ceiling insulation is applied to either 500 ft^2 or 20% of the total ceiling area, whichever is less. As per the suggested amendment the reduced insulation is applied to 500 ft^2 of the ceiling area regardless of the conditioned floor area.

Analysis B-4

This analysis was performed to evaluate the suggested amendment to modify Tables N1102.1.1 and N1102.1.3, 2012 IRC, and Tables R402.1.1 and R402.1.3, 2012 IECC by reducing the insulation R-values for walls with wood frame construction. For this analysis, the specifications for wall insulation were changed from R-13+5 as specified in Table R402.1.3, 2012 IECC to R-13 as specified in the suggested amendment. This was compared to a corresponding TBEPS compliant base-case house. The analysis was performed for Climate Zone 3 and Climate Zone 4 as described in the TBEPS.

Table B-2 presents a difference in the annual energy consumption from reducing wood frame wall insulation from R-13+5 to R-13 in Climate Zone 3 and 4 of the 2012 IECC compliant test-case. The test case was compared to the corresponding TBEPS compliant base-case. The suggested amendment is more stringent than the TBEPS compliant base-case.

Table B-2: Comparing Annual Energy Consumption for 2012 IECC Compliant Test-Case w/ Wood Frame Wall Insulation of R-13 in Climate Zone 3 and 4 with the TBEPS Compliant Base-Case

County	2009 IECC Climate Zones	% Difference in Total Energy Consumption (2009 IECC Source) Positive values indicate increase in stringency	
		Gas Heating, Gas Domestic Hot Water (DHW)	Heat Pump Heating, Electric Domestic Hot Water (DHW)
Tarrant	**3**	18%	14%
Potter	**4**	6%	5%

Notes:

1. Percent Difference in Total Energy Consumption:
   [Base-case energy consumption (2009 IECC) – Test-case energy consumption (2012 IECC w/ R-13)] / Base-case energy consumption (2009 IECC) %.
2. This analysis used the performance path approach to show compliance with 2009 IECC.
3. Base-case Simulation Assumptions:
   Analysis used a 2,325 ft2 single-family house, single-story, four bedrooms, slab-on-grade, ducts in the conditioned, ventilated attic, window-to floor ratio: 15%, windows equally distributed (N,E,S,W) with no exterior shading. All other roof, wall and window parameters were modeled as per specifications in Chapter 4 of the 2009 IECC for the counties shown. Two base-case buildings were considered: Natural gas space heating and DHW, and heat-pump space heating and electric DHW.
4. 2009 IECC Source Energy:
   As per Section 405.1 of the 2009 IECC, compliance with the 2009 code is established using heating, cooling, and service water heating only. As per Section 405.3 of the 2009 IECC, a factor of 3.16 is used to calculate the source energy generation for electricity consumption and a factor of 1.1 was used to calculate source energy generation for natural gas consumption.

Analysis B-7

This analysis was performed to evaluate the suggested amendment to modify Table R402.1.1 and Table R402.1.3 of the 2012 IECC by increasing the values of the solar heat gain coefficient specifications for Climate Zone 2 and Climate Zone 3. For this analysis the specifications for window SHGC were changed from 0.25 as specified in Table R402.1.1 and Table R402.1.3, 2012 IECC to 0.4 as specified in the suggested amendment. This was compared to a corresponding TBEPS compliant base-case house. The analysis was performed for Climate Zone 2 and Climate Zone 3 as described in the TBEPS.

Table B-3 presents the difference in annual energy consumption from increasing the SHGC from 0.25 to 0.4 in Climate Zones 2 and 3 of the 2012 IECC compliant test-case. The test-case was compared to the TBEPS compliant base-case. The suggested amendment is more stringent than the TBEPS compliant base-case.

Table B-3: Comparing Annual Energy Consumption for 2012 IECC Compliant Test-Case w/ 0.4 SHGC in Climate Zone 3 and 4 with the TBEPS Compliant Base-Case

County	2009 IECC Climate Zones	% Difference in Total Energy Consumption (2009 Source) Positive values indicate increase in stringency	
		Gas Heating, Gas Domestic Hot Water (DHW)	Heat Pump Heating, Electric Domestic Hot Water (DHW)
Harris	**2**	13%	9%
Tarrant	**3**	17%	12%

Notes:

1. Percent Difference in Total Energy Consumption:
   [Base-case energy consumption (2009 IECC) – Test-case energy consumption (2012 IECC w/ 0.4 SHGC)] / Base-case energy consumption (2009 IECC) %.
2. This analysis used the performance path approach to show compliance with 2009 IECC.
3. Base-case Simulation Assumptions:
   Analysis used a 2,325 ft2 single-family house, single-story, four bedrooms, slab-on-grade, ducts in the conditioned, ventilated attic, window-to floor ratio: 15%, windows equally distributed (N,E,S,W) with no exterior shading. All other roof, wall and window parameters were modeled as per specifications in Chapter 4 of the 2009 IECC for the counties shown. Two base-case buildings were considered: Natural gas space heating and DHW, and heat-pump space heating and electric DHW.
4. 2009 IECC Source Energy:
   As per Section 405.1 of the 2009 IECC, compliance with the 2009 code is established using heating, cooling, and service water heating only. As per Section 405.3 of the 2009 IECC, a factor of 3.16 is used to calculate the source energy generation for electricity consumption and a factor of 1.1 was used to calculate source energy generation for natural gas consumption.

TAB Suggestion B-1

National Association of Home Builders Recommended Amendments to the 2012 International Residential Code (IRC)

Issue: Ceilings without Attic Spaces

2012 IRC Section: Chapter 11, N1102.2.2

Recommended Amendment:
Modify the Section as shown below (Delete text):

N1102.2.2 Ceilings without attic spaces. Where Section N1102.1.1 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section N1102.1.1 shall be limited to 500 square feet (46 m2) ~~or 20% of the total insulated ceiling area, which ever is less.~~ This reduction shall not apply to the U-factor alternative approach in Section N1102.1.3 and the total UA alternative in Section N1102.1.4

Reason:

The purpose of this amendment is to help alleviate the confusion in the 2012 International Residential Code Chapter 11 (IRC). Without this amendment, the IRC Chapter 11 would limit the ceiling areas eligible for reduced R-value due to a framing cavity restriction.

The Chapter 11 already has a limit (500 sq. ft) for this application. This additional limit adds a calculation to determine the second limit and therefore is more confusing than it is worth. Typically, smaller homes have smaller rafter requirements based on shorter spans. Allowing the proper sized framing material to handle the loads is not only cost-effective, but saves our natural resources. Adding insulation alone can be cost effective. But when having to install larger rafters in order to meet minimum insulation requirements would not be considered a justified cost. This change will result in an increased rafter size simply to accommodate more insulation thus making it economically unreasonable.

National Association of Home Builders
Recommended State & Local Amendments to the
2012 International Energy Conservation Code (IECC)

Issue: Ceilings without Attic Spaces

2012 IECC Section: R402.2.2

Recommended Amendment:
Modify the Section as shown below (Delete text):

R402.2.2 Ceilings without attic spaces. Where Section 402.1.1 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section 402.1.1 shall be limited to 500 square feet (46 m2) ~~or 20% of the total insulated ceiling area, which ever is less.~~ This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4

Reason:

The purpose of this amendment is to help alleviate the confusion in the 2012 International Energy Conservation Code (IECC). Without this amendment, the IECC would limit the ceiling areas eligible for reduced R-value due to a framing cavity restriction.

The IECC already has a limit (500 sq. ft) for this application. This additional limit adds a calculation to determine the second limit and therefore is more confusing than it is worth. Typically, smaller homes have smaller rafter requirements based on shorter spans. Allowing the proper sized framing material to handle the loads is not only cost-effective, but saves our natural resources. Adding insulation alone can be cost effective. But when having to install larger rafters in order to meet minimum insulation requirements would not be considered a justified cost. This change will result in an increased rafter size simply to accommodate more insulation thus making it economically unreasonable.

For these reasons we encourage the adoption of this amendment.

TAB Suggestion B-2

National Association of Home Builders Recommended Amendments to the 2012 International Residential Code (IRC)

Issue: Insulation Requirements by Components- Basement Wall R-value and U-value

2012 IECC Section: Chapter 11, Table N1102.1.1 and Table N1102.1.3

Recommended Amendment:
Modify the Tables as shown below: (Delete data, add new data)

TABLE N1102.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b,e]	CEILING *R*-VALUE	WOOD FRAME 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
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	20 or 13+5[h]	8/13	19	5/13[f]	0	5/13
4 except Marine	0.35	0.55	0.40	49	20 or 13+5[h]	8/13	19	10/13	10, 2ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5[h]	13/17	30[g]	10/13	10, 2ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10[h]	15/20	30[g]	~~15/19~~ 10/13	10, 4ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10[h]	19/21	38[g]	~~15/19~~ 10/13	10, 4ft	15/19

All footnotes shall remain

TABLE N1102.1.3
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	0.50	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.082	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	0.057	0.098	0.047	0.091[c]	0.136
4 except Marine	0.35	0.55	0.026	0.057	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	0.057	0.082	0.033	0.059	0.055
6	0.32	0.55	0.026	0.048	0.060	0.033	~~0.050~~ 0.059	0.055
7 and 8	0.32	0.55	0.026	0.048	0.057	0.028	~~0.050~~ 0.059	0.055

All Footnotes remain unchanged

Reason:

The purpose of this amendment is to retain the basement wall R-values of the 2006 IRC Chapter 11, and provide a more realistic value and cost benefit.

The saving claimed by the proponent during the Code Hearings cannot be substantiated. The documented increase in construction costs for installing the higher R-value insulation are not justified by the negligible amount of energy savings attained. The basement wall requirement of the 2012 IRC Chapter 11 results in increased construction costs, unsubstantiated cost effectiveness of the cost vs. energy savings and the difficulty of having two distinct requirements which will result in inconsistent enforcement. In addition, the provisions in the 2012 IRC Chapter 11 may cause basement moisture and health problems for the homeowner.

History has shown that basement moisture problems significantly increased in Minnesota when basement insulation requirements were increased. This additional interior insulation will cause the basement foundation wall to be colder, thus increasing the amount of moisture that condenses on the wall. Ultimately this moisture buildup behind a finished basement wall results in mold, rot, and insect problems.

Specially designed and costly moisture resistant designs that are not covered by the IRC Chapter 11 will be needed in order to avoid these potential problems. This amendment will retain the basement insulation requirements of the 2006 IECC that are proven to be a method of reducing moisture build-up while providing building envelope insulation.

For these reasons we encourage the adoption of this amendment.

National Association of Home Builders Recommended State & Local Amendments to the 2012 International Energy Conservation Code (IECC)

Issue: Insulation Requirements by Components- Basement Wall R-value and U-value

2012 IECC Section: Table 402.1.1 and Table 402.1.3

Recommended Amendment:
Modify the Tables as shown below: (Delete data, add new data)

TABLE R402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME 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
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	20 or 13+5[h]	8/13	19	5/13[f]	0	5/13
4 except Marine	0.35	0.55	0.40	49	20 or 13+5[h]	8/13	19	10/13	10, 2ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5[h]	13/17	30[g]	10/13	10, 2ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10[h]	15/20	30[g]	~~15/19~~ 10/13	10, 4ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10[h]	19/21	38[g]	~~15/19~~ 10/13	10, 4ft	15/19

All footnotes shall remain

TABLE R402.1.3
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	0.50	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.082	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	0.057	0.098	0.047	0.091[c]	0.136
4 except Marine	0.35	0.55	0.026	0.057	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	0.057	0.082	0.033	0.059	0.055
6	0.32	0.55	0.026	0.048	0.060	0.033	~~0.050~~ 0.059	0.055
7 and 8	0.32	0.55	0.026	0.048	0.057	0.028	~~0.050~~ 0.059	0.055

All Footnotes remain unchanged

Reason:

The purpose of this amendment is to retain the basement wall R-values of the 2006 IECC, and provide a more realistic value and cost benefit.

The saving claimed by the proponent during the Code Hearings cannot be substantiated. The documented increase in construction costs for installing the higher R-value insulation are not justified by the negligible amount of energy savings attained. The basement wall requirement of the 2012 IECC results in increased construction costs, unsubstantiated cost effectiveness of the cost vs. energy savings and the difficulty of having two distinct requirements which will result in inconsistent enforcement. In addition, the provisions in the 2012 IECC may cause basement moisture and health problems for the homeowner.

History has shown that basement moisture problems significantly increased in Minnesota when basement insulation requirements were increased. This additional interior insulation will cause the basement foundation wall to be colder, thus increasing the amount of moisture that condenses on the wall. Ultimately this moisture buildup behind a finished basement wall results in mold, rot, and insect problems.

Specially designed and costly moisture resistant designs that are not covered by the IECC will be needed in order to avoid these potential problems. This amendment will retain the basement insulation requirements of the 2006 IECC that are proven to be a method of reducing moisture build-up while providing building envelope insulation.

For these reasons we encourage the adoption of this amendment.

TAB Suggestion B-3

National Association of Home Builders Recommended State & Local Amendments to the 2012 International Residential Code (IRC)

Issue: The Elimination of Equipment Trade-offs

2012 IRC Section: Chapter 11, Table N1105.5.2(1)

Recommended Amendment:
Modify the Table as shown below (Delete text, add New Text)

TABLE N1105.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating systems [f, g],	~~As proposed for other than electric heating without a heat pump. Where the proposed design utilizes electric heating without a heat pump the standard reference design shall be an air source heat pump meeting the requirements of Section R403 of the IECC-Commercial Provisions.~~ Fuel type: same as proposed design Efficiencies: Electric: air-source heat pump with prevailing federal minimum efficiency Nonelectric furnaces: natural gas furnace with prevailing federal minimum efficiency Nonelectric boilers: natural gas boiler with prevailing federal minimum efficiency Capacity: sized in accordance with Section N1103,6	As proposed
Cooling system [f,h]	~~As proposed~~ Fuel type: Electric Efficiency: in accordance with prevailing federal minimum standards Capacity: sized in accordance with Section R403,6	As proposed
Service Water Heating [f,g,h,i]	~~As proposed~~ Fuel type: same as proposed design Efficiency: in accordance with prevailing Federal minimum standards Use: gal/day = 30 + 10 × *Nbr* Tank temperature: 120°F ~~Use: same as proposed design~~	As proposed Same as standard reference ~~gal/day = 30 + 10 × *Nbr*~~

(Remainder of Table remains unchanged)

Reason:
The purpose of this amendment is to retain the original equipment trade-off provisions from the 2006 International Residential Code (IRC) Chapter 11 for the heating systems, cooling systems, and service water heating.
By retaining these, builders have an opportunity to optimize a code-compliant house design by using energy efficient equipment.

Eliminating the ability to use equipment efficiency as a means to achieve whole-house energy conservation will discourage the use of higher efficiency equipment. Quite often, the use of this high efficiency equipment provides a more cost effective solution to achieve code compliance. Eliminating this ability discourages the concept of the "house as a system" approach which is a cornerstone of many state energy programs and the Federal Energy Star Program. In fact, without this amendment the current practice for constructing an Energy Star home in this jurisdiction would be disallowed.

Without accepting this amendment will force a negative impact on the installation of state-of- the-art, more energy efficient equipment, it will increase the cost of construction by driving builders to often use less efficient equipment while dramatically increasing the cost of construction of the building envelope, namely windows and fiberglass insulation.

Significant improvements in the efficiency of HVAC and water heating equipment have been made in the last 20 years.. With the increased emphasis on new and improved technologies, this trend will continue and will result in even higher energy savings in future years. Eliminating the ability to recognize the value of these technologies in the marketplace will prove detrimental to all builders and ultimately the homeowners.

One of the easiest ways to conserve energy is to utilize high efficiency equipment. The 2012 IRC Chapter 11 code does not provide any incentives for the builder to install high efficiency equipment, but rather continues the use of the minimum equipment efficiencies established by federal standards.

The language in the 2012 IRC Chapter 11 effectively removes the use of high efficiency HVAC equipment as a reasonable and cost-effective solution to achieve compliance. Failure to remove the existing language concentrates solely on the building envelope by focusing on insulation/windows to meet specific energy targets.

For these reasons we encourage the adoption of this amendment.

National Association of Home Builders Recommended State & Local Amendments to the 2012 International Energy Conservation Code (IECC)

Issue: The Elimination of Equipment Trade-offs

2012 IECC Section: Table R405.5.2(1)

Recommended Amendment:
Modify the Table as shown below (Delete text, add New Text)

TABLE R405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating systems [f, g],	~~As proposed for other than electric heating without a heat pump. Where the proposed design utilizes electric heating without a heat pump the standard reference design shall be an air source heat pump meeting the requirements of Section R403 of the IECC-Commercial Provisions.~~ Fuel type: same as proposed design Efficiencies: Electric: air-source heat pump with prevailing federal minimum efficiency Nonelectric furnaces: natural gas furnace with prevailing federal minimum efficiency Nonelectric boilers: natural gas boiler with prevailing federal minimum efficiency Capacity: sized in accordance with Section R403,6	As proposed
Cooling system [f,h]	~~As proposed~~ Fuel type: Electric Efficiency: in accordance with prevailing federal minimum standards Capacity: sized in accordance with Section R403,6	As proposed
Service Water Heating [f,g,h,i]	~~As proposed~~ Fuel type: same as proposed design Efficiency: in accordance with prevailing Federal minimum standards Use: gal/day = 30 + 10 × *Nbr* Tank temperature: 120°F ~~Use: same as proposed design~~	As proposed Same as standard reference ~~gal/day = 30 + 10 × *Nbr*~~

(Remainder of Table remains unchanged)

Reason:
The purpose of this amendment is to retain the original equipment trade-off provisions from the 2006 International Energy Conservation Code (IECC) for the heating systems, cooling systems, and service water heating.
By retaining these, builders have an opportunity to optimize a code-compliant house design by using energy efficient equipment.

Eliminating the ability to use equipment efficiency as a means to achieve whole-house energy conservation will discourage the use of higher efficiency equipment. Quite often, the use of this high efficiency equipment provides a more cost effective solution to achieve code compliance. Eliminating this ability discourages the concept of the "house as a system" approach which is a cornerstone of many state energy programs and the Federal Energy Star Program. In fact, without this amendment the current practice for constructing an Energy Star home in this jurisdiction would be disallowed.

Without accepting this amendment will force a negative impact on the installation of state-of- the-art, more energy efficient equipment, it will increase the cost of construction by driving builders to often use less efficient equipment while dramatically increasing the cost of construction of the building envelope, namely windows and fiberglass insulation.

Significant improvements in the efficiency of HVAC and water heating equipment have been made in the last 20 years.. With the increased emphasis on new and improved technologies, this trend will continue and will result in even higher energy savings in future years. Eliminating the ability to recognize the value of these technologies in the marketplace will prove detrimental to all builders and ultimately the homeowners.

One of the easiest ways to conserve energy is to utilize high efficiency equipment. The 2012 IECC code does not provide any incentives for the builder to install high efficiency equipment, but rather continues the use of the minimum equipment efficiencies established by federal standards.

The language in the 2012 IECC effectively removes the use of high efficiency HVAC equipment as a reasonable and cost-effective solution to achieve compliance. Failure to remove the existing language concentrates solely on the building envelope by focusing on insulation/windows to meet specific energy targets.

For these reasons we encourage the adoption of this amendment.

TAB Suggestion B-4

National Association of Home Builders
Recommended Amendments to the 2012 International Residential Code (IRC)

Issue: Wood Frame Wall Insulation

2012 IRC Section: Chapter 11, Table N1102.1.1 and Table N1102.1.3

Recommended Amendment:
Modify the Tables as shown below: (Delete data, add new data)

TABLE N1102.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME 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
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	~~20 or 13+5[h]~~ 13	8/13	19	5/13[f]	0	5/13
4 except Marine	0.35	0.55	0.40	49	~~20 or 13+5[h]~~ 13	8/13	19	10/13	10, 2ft	10/13
5 and Marine 4	0.32	0.55	NR	49	~~20~~ 19 or 13+5[h]	13/17	30[g]	15/19	10, 2ft	15/19
6	0.32	0.55	NR	49	~~20~~ 19 or 13+5[h]	15/20	30[g]	15/19	10, 4ft	15/19
7 and 8	0.32	0.55	NR	49	~~20~~ 19+5 or 13+10[h]	19/21	38[g]	15/19	10, 4ft	15/19

All footnotes shall remain

TABLE N1102.1.3
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	0.50	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.082	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	~~0.057~~ 0.082	0.098	0.047	0.091[c]	0.136
4 except Marine	0.35	0.55	0.026	~~0.057~~ 0.082	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	~~0.057~~ 0.060	0.082	0.033	0.059	0.055
6	0.32	0.55	0.026	~~0.048~~ 0.060	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	~~0.048~~ 0.057	0.057	0.028	0.050	0.055

All Footnotes remain unchanged

Reason:

The purpose of this amendment is to retain the Wood Frame Wall R-value in Climate Zones 5 and Marine 4 to the requirements that were established in the 2006 International Residential Code (IRC).

A change to the 2009 IRC Chapter 11 and continued in the 2012 IRC Chapter 11 provided a market advantage to a few primary building materials, and thus fails to adequately address all primary building materials in a fair and equitable manner. The blown cellulose and the spray foam used in residences can achieve R-19 but do not typically achieve R-20 in a 2x6 wall cavity. Although cellulose and spray foam do not achieve the R-20, they have been proven to be much more effective in reducing air infiltration than other insulation materials being used.

Air infiltration can account for 30% of a building's heating and cooling costs and contributes to problems with moisture and air quality. Reducing the infiltration can significantly cut annual heating and cooling costs, improve building durability and create a healthier indoor environment.

The change to the 2009 IRC Chapter 11 and continued in the 2012 IRC Chapter 11 excludes products that are widely used in the construction industry and would adversely affect the cost of construction. This change eliminates materials that have a proven track record of providing energy conservation, thus making it economically unreasonable and creating a negative financial impact.

This amendment will retain the original requirements of the 2006 IRC Chapter 11, and will allow multiple products to be used to insulate a home, thus permitting all types of insulation to remain competitive and benefit the builder and home owner with lower construction costs.

For this reason we request that the amendment be considered for adoption.

National Association of Home Builders
Recommended State & Local Amendments to the
2012 International Energy Conservation Code (IECC)

Issue: Wood Frame Wall Insulation

2012 IECC Section: Table R402.1.1 and Table R402.1.3

Recommended Amendment:
Modify the Tables as shown below: (Delete data, add new data)

TABLE R402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME 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
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	~~20 or 13+5[h]~~ 13	8/13	19	5/13[f]	0	5/13
4 except Marine	0.35	0.55	0.40	49	~~20 or 13+5[h]~~ 13	8/13	19	10/13	10, 2ft	10/13
5 and Marine 4	0.32	0.55	NR	49	~~20~~ 19 or 13+5[h]	13/17	30[g]	15/19	10, 2ft	15/19
6	0.32	0.55	NR	49	~~20~~ 19 or 13+5[h]	15/20	30[g]	15/19	10, 4ft	15/19
7 and 8	0.32	0.55	NR	49	~~20~~ 19+5 or 13+10[h]	19/21	38[g]	15/19	10, 4ft	15/19

All footnotes shall remain

TABLE R402.1.3
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	0.50	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.082	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	~~0.057~~ 0.082	0.098	0.047	0.091[c]	0.136
4 except Marine	0.35	0.55	0.026	~~0.057~~ 0.082	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	~~0.057~~ 0.060	0.082	0.033	0.059	0.055
6	0.32	0.55	0.026	~~0.048~~ 0.060	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	~~0.048~~ 0.057	0.057	0.028	0.050	0.055

All Footnotes remain unchanged

Reason:

The purpose of this amendment is to retain the Wood Frame Wall R-value in Climate Zones 5 and Marine 4 to the requirements that were established in the 2006 International Energy Conservation Code (IECC).

The change to the 2012 IECC provided a market advantage to a few primary building materials, and thus fails to adequately address all primary building materials in a fair and equitable manner. The blown cellulose and the spray foam used in residences can achieve R-19 but do not typically achieve R-20 in a 2x6 wall cavity. Although cellulose and spray foam do not achieve the R-20, they have been proven to be much more effective in reducing air infiltration than other insulation materials being used.

Air infiltration can account for 30% of a building's heating and cooling costs and contributes to problems with moisture and air quality. Reducing the infiltration can significantly cut annual heating and cooling costs, improve building durability and create a healthier indoor environment.

The change to the 2012 IECC excludes products that are widely used in the construction industry and would adversely affect the cost of construction. This change eliminates materials that have a proven track record of providing energy conservation, thus making it economically unreasonable and creating a negative financial impact.

This amendment will retain the original requirements of the 2006 ECC, and will allow multiple products to be used to insulate a home, thus permitting all types of insulation to remain competitive and benefit the builder and home owner with lower construction costs.

For this reason we request that the amendment be considered for adoption.

TAB Suggestion B-5

National Association of Home Builders Recommended Amendments to the 2012 International Residential Code (IRC)

Issue: Duct Sealing

2012 IRC Section: N1103.2.2

Recommended Amendment:
Modify the Section as shown below (Delete text):

N1103.2.2 (R403.2.2) Sealing (Mandatory). Ducts, air handlers, and filter boxes shall be sealed. Joints and seams shall comply with Section M1601.4.1 of this code.
Exceptions:
1. Air-impermeable spray foam products shall be permitted to be applied without additional joint seals.
2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.
3. Continuously welded and locking-type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.

Duct tightness shall be verified by ~~either of~~ the following:

~~1. Postconstruction test: Total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 square feet (9.29 m2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.~~
~~2.~~ 1. Rough-in test: Total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 ft2 (9.29 m2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure. All registers shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 3 cfm (85 L/min) per 100 square feet (9.29 m2) of conditioned floor area.

Exception: The total leakage test is not required for ducts and air handlers located entirely within the building thermal envelope.

Reason:
The purpose of this amendment is to eliminate a section that was added to the 2012 IRC Chapter 11 that will be problematic in that it must be enforced after the construction is completed and the duct is covered with drywall. If a leak does exist at post-construction how is it to be located or repaired?

The section still requires inspection and testing, but at the only feasible time of construction, at rough-in.

For these reasons we encourage the adoption of this amendment.

TAB Suggestion B-6

Recommended Amendments to the 2012 International Residential Code (IRC)

Issue: Building Cavities

2012 IRC Section: N1103.2.3

Recommended Amendment:
Modify the Section as shown below (Delete text):

N1103.2.3 (R403.2.3) Building cavities (Mandatory).
Building framing cavities shall not be used as supply ducts ~~or plenums~~. Building cavities used as plenums shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction and shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material.

Reason:
The purpose of this amendment is to allow a building practice that is commonly used. Adding the language on sealing of the plenum increases the efficiency of the system without the cost of running the entire HVAC air return system in duct.

For these reasons we encourage the adoption of this amendment.

TAB Suggestion B-7

National Association of Home Builders
Recommended State & Local Amendments to the
2012 International Energy Conservation Code (IECC)

Issue: Solar Heat Gain Requirements in Southern Climates

2012 IECC Section: Table R402.1.1

Recommended Amendment:
Modify the Tables as shown below: (Delete data, add new data)

TABLE R402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME 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
1	NR	0.75	~~0.25~~ 0.40	30	13	3/4	13	0	0	0
2	0.40	0.65	~~0.25~~ 0.40	38	13	4/6	13	0	0	0
3	0.35	0.55	~~0.25~~ 0.40	38	20 or 13+5[h]	8/13	19	5/13[f]	0	5/13
4 except Marine	0.35	0.55	0.40	49	20 or 13+5[h]	8/13	19	10/13	10, 2ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5[h]	13/17	30[g]	15/19	10, 2ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10[h]	15/20	30[g]	15/19	10, 4ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10[h]	19/21	38[g]	15/19	10, 4ft	15/19

All Footnotes remain unchanged

Reason:

The purpose of this amendment is to retain the Solar Heat Gain Coefficient (SHGC) of the 2006 IECC and provides a more realistic target that can be compliant with the products that are readily available in those climate zones 1, 2 & 3.

The market produces very few windows with a solar heat gain coefficient (SHGC) less than 0.35. This makes it difficult to comply with this requirement in Zones 1 through 3. There are even fewer doors manufactured with glazing that meet the 0.30 SHGC requirement.

Another concern is when the SHGC is lowered, less daylight passes through the window. This will cause the consumer to rely on more windows or more interior lighting, thus negating the energy saved through the provisions of the 2009 IECC. Therefore the provisions of the 2012 IECC causes more energy to be consumed, instead of conserving energy as is the intention of the IECC.

The proponent of the change to the 2009 IECC and the 2012 IECC introduced these requirements knowing that only one glass manufacturer can supply the glass required. This results in capturing unfairly the market shares for glass away from its competitors.

This amendment retains the original requirements of the 2006 IECC allowing multiple window glass products to be used in a home, thus permitting all types of window glass to remain competitive and benefit the builder with lower costs, thus providing the homeowners with available products that are not limited to a few manufacturers and ultimately lower costs.

For these reasons we encourage the adoption of this amendment.

Newport Suggestion B-8

DRAFT-2/8/12

CHAPTER 1 [CE]
SCOPE AND ADMINSTRATION

SECTION C101
SCOPE AND GENERAL REQUIREMENTS

C101.1 Title. This code shall be known as the ~~*International Energy Conservation Code* of **[NAME OF JURISDICTION]** and shall be cited as such.~~ *Illinois Energy Conservation Code* or this code and shall mean:

With respect to the State facilities covered by Subpart B of TITLE 71 Ill. Adm. Code 600:

This Part, all additional requirements incorporated within Subpart B (including ASHRAE 90.1 Standards, including all published errata and excluding published supplements which encompasses ASHRAE 90.1), and any statutorily authorized adaptations to the incorporated standards adopted by CDB is effective January 29, 2010.

With respect to the privately funded commercial facilities covered by Subpart C of TITLE 71 Ill. Adm. Code 600:

This Part, all additional requirements incorporated within Subpart C (including the 2012 International Energy Conservation Code, including all published errata and excluding published supplements which encompasses ASHRAE 90.1), and any statutorily authorized adaptations to the incorporated standards adopted by CDB is effective January 29, 2010.

C101.1.2 Adoption. The Board shall adopt the code within 9 months after its publication. The code shall take effect within 3 months after it is adopted by the Board and shall apply to any new building or structure in this State for which a building permit application is received by a municipality or county, except as otherwise provided by the EEB Act.

C101.1.3 Adaptation. The Board may appropriately adapt the International Energy Conservation Code to apply to the particular economy, population distribution, geography, and climate of the State and construction therein, consistent with the public policy objectives of the EEB Act.

C101.5 Compliance. ~~*Residential buildings* shall meet the provisions of IECC – Residential Provisions.~~ *Commercial buildings* shall meet the provisions of ~~IECC-Commercial Provisions~~ the *Illinois Energy Conservation Code* covered by subpart C of TITILE 71 Ill.Adm. Code 600. The local authority having jurisdiction (AHJ) shall establish its own procedures for enforcement of the Illinois Energy Conservation Code. Minimum compliance shall be demonstrated by submission of:

1. The compliance forms published in the ASHRAE 90.1 User's Manual; or
2. Compliance Certificates generated by the U.S. Department of Energy's COMCheck Code compliance tool; or
3. Other comparable compliance materials that meet or exceed, as determined by the AHJ, the compliance forms published in the ASHRAE 90.1 User's Manual or the U.S. Department of Energy's COMcheck code compliance tool; or
4. The seal of the architect/engineer as required by Section 14 of the Illinois Architectural Practice Act [225 ILCS 305], Section 12 of the Structural Engineering Licensing Act [225 ILCS 340] and Section 14 of the Illinois Professional Engineering Practice Act [225 ILCS 325]

C102.1.1 Above code program. ~~The *code official* or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program to exceed the energy efficiency required by this code.~~ No unit of local government, including any home rule unit, may apply energy efficient building standards to privately funded commercial facilities in a manner that is less stringent than the Code as described in this Subpart C. However, nothing in the EEB Act or this Subpart prevents a unit of local government from adopting an energy efficiency code or standards that are more stringent than this code. Buildings *approved* in writing by such an energy efficient program shall be considered in compliance with this code. The requirements identified as "mandatory" in Chapter 4 shall be met.

Page | 1

SECTION C109
BOARD OF APPEALS

C109.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there ~~shall~~ may be created a board of appeals. The *code official* shall be an ex officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official.*

C109.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training ~~and are not employees of the jurisdiction.~~

CHAPTER 2 [CE]
DEFINITIONS

SECTION C202
GENERAL DEFINITIONS

ADD THE FOLLOWING Definitions:

AUTHORITY HAVING JURISDICTION or AHJ. Means the organization, officer or individual responsible for approving equipment, materials, an installation or procedure.

BOARD. Means the Illinois Capital Development Board
EEB ACT. Means the Energy Efficient Building Act [20ILCS 3125].

COUNCIL. Means the Illinois Energy Conservation Advisory Council whose purpose is to recommend modifications to the *Illinois Energy Conservation Code.*

Page | 2

PART 1 – SCOPE AND APPLICATION

SECTION R101
SCOPE AND GENERAL REQUIREMENTS

R101.1 Title. This code shall be known as the ~~*International Energy Conservation Code* of **[NAME OF JURISDICTION],** and shall be cited as such. It is referred to hereinas "the code".~~ *Illinois Energy Conservation Code* or this code, and shall mean:

With respect to the residential buildings covered by Subpart D of TITLE 71 Ill. Adm. Code 600:

This Part, all additional requirements incorporated within Subpart D (including the 2012 International Energy Conservation Code, including all published errata excluding published supplements) and any statutorily authorized adaptations to the incorporated standards adopted by CDB is effective January 29, 2010.

R101.1.2 Adoption. The Board shall adopt the code within 9 months after its publication. The code shall take effect within 3 months after it is adopted by the Board and shall apply to any new building or structure in this State for which a building permit application is received by a municipality or county, except as otherwise provided by the EEB Act.

R101.1.3 Adaptation. The Board may appropriately adapt the International Energy Conservation Code to apply to the particular economy, population distribution, geography, and climate of the State and construction therein, consistent with the public policy objectives of the EEB Act.

R101.4.3 Additions, alterations, renovations or repairs. Additions, alterations, renovations or repairs to an existing building, building system or portion thereof shall conform to the provisions of this code as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with this code. In the case of any addition, alteration, renovation or repair to an existing residential structure, the Code applies only to the portions of that structure that are being added, altered, renovated or repaired [20 ILCS 3125/20(a)]. Additions, alterations, renovations or repairs shall not create unsafe or hazardous condition or overload existing building systems. An addition shall be deemed to comply with this code if the addition alone complies or if the existing building and addition comply with this code as a single building.

Exception: The following need not comply provided the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.
2. Glass only replacements in an existing sash and frame.
3. Existing ceiling, wall, or floor cavities exposed during construction provided that these cavities are filled with insulation
4. Construction where the existing roof, wall or floor cavity is not expose.
5. Reroofing for roofs where neither the sheathing nor the insulation is exposed. Roofs without insulation in the cavity and where the sheathing or insulation is exposed during reroofing shall be insulated either above or below the sheathing.
6. Replacement of existing doors that separate *conditioned space* from the exterior shall not require the installation of a vestibule or revolving door, provided, however, that an existing vestibule that separates a *conditioned space* from the exterior shall not be removed.
7. Alterations that replace less than 50 percent of the luminaires in a space, provided that such alterations do not increase the installed interior lighting power.
8. Alterations that replace only the bulb and ballast within the existing luminaires in a space provided that the *alteration* does not increase the installed interior lighting power.

R101.5 Compliance. *Residential buildings* shall meet the provisions of ~~IECC—Residential Provisions~~ the *Illinois Energy Conservation Code* covered by subpart D of TITLE 71 Ill.Adm. Code 600. The local authority having jurisdiction (AHJ) shall establish its own procedures for enforcement of the Illinois Energy Conservation Code. ~~*Commercial buildings* shall meet the provisions of IECC-Commercial Provisions~~ Minimum compliance shall be demonstrated by submission of:

1. Compliance Certificates generated by the U.S. Department of Energy's RESCheck Code compliance tool; or

2. Other comparable compliance materials that meet or exceed, as determined by the AHJ, U.S. Department of Energy's RESCheck code compliance tool; or

3. The seal of the architect/engineer as required by Section 14 of the Illinois Architectural Practice Act [225 ILCS 305], Section 12 of the Structural Engineering Licensing Act [225 ILCS 340] and Section 14 of the Illinois Professional Engineering Practice Act [225 ILCS 325]

SECTION R102
ALTERNATIVE MATERIALS – METHOD OF CONSTRUCTION, DESIGN OR INSULATING SYSTEMS

R102.1.1 Above code programs. ~~The *code official* or other authority having jurisdiction shall be permitted to deem a national, state, or local energy efficiency program to exceed the energy efficiency required by the code~~ No unit of local government, including any home rule unit, may regulate energy efficient building standards for residential building in a manner that is either less or more stringent that the standards established pursuant to this code. Buildings approved in writing by such an energy efficient program shall be considered in compliance with this code. The requirements identified as "mandatory" in Chapter 4 shall be met.

However, the following entities may regulate energy efficient building standards for residential buildings in a manner that is more stringent than the provisions contained in this code:

i) A unit of local government, including a home rule unit, that has, on or before May 15, 2009, adopted or incorporated by reference energy efficient building standards for residential buildings that are equivalent to or more stringent than the 2006 International Energy Conservation Code;

ii) A unit of local government, including a home rule unit, that has, on or before May 15, 2009, provided to the Capital Development Board, as required by Section 55 of the Illinois Building Commission Act, an identification of an energy efficient building code or amendment that is equivalent to or more stringent than the 2006 International Energy Conservation Code; and

iii) A municipality with a population of 1,000,000 or more.

SECTION R109
BOARD OF APPEALS

R109.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there ~~shall~~ may be created a board of appeals. The *code official* shall be an ex officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official.*

R109.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training ~~and are not employees of the jurisdiction.~~

CHAPTER 2 [RE]
DEFINITIONS

SECTION R202
GENERAL DEFINITIONS

ADD THE FOLLOWING Definitions:

AUTHORITY HAVING JURISDICTION or AHJ. Means the organization, officer or individual responsible for approving equipment, materials, an installation or procedure

BOARD. Means the Illinois Capital Development Board

EEB ACT. Means the Energy Efficient Building Act [20ILCS 3125]

COUNCIL. Means the Illinois Energy Conservation Advisory Council whose purpose is to recommend modifications to the *Illinois Energy Conservation Code*.

LOCAL EXHAUST. An exhaust system that uses one or more fans to exhaust air from a specific room or rooms within a dwelling.

RESIDENTIAL BUILDING. ~~For this code, includes detached one- and two-family dwellings and multiple single-family dwellings (townhouses) as well as Group R-2, R-3 and R-4 buildings three stories or less in height above grade plane.~~ Means a detached one-family or 2-family dwelling or any building that is 3 stories or less in height above grade that contains multiple dwelling units. In which the occupants reside on a primarily permanent basis, such as a townhouse, a row house, an apartment house, a convent, a monastery, a rectory, a fraternity or sorority house, a dormitory, and a rooming house; provided, however, that when applied to a building located within the boundaries of a municipality having a population of 1,000,000 or more, the term "residential building" means a building containing one or more dwelling units, not exceeding 4 stories above grade, where occupants are primarily permanent.

WHOLE HOUSE MECHANICAL VENTILATION SYSTEM. An exhaust system, supply system, or combination thereof that is designed in accordance with Section R403.5 to mechanically exchange indoor air for outdoor air when operating continuously or through a programmed intermittent schedule to satisfy the whole house ventilation rate. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

CHAPTER 4 [RE]
RESIDENTIAL ENERGY EFFICIENCY

SECTION R402
BUILDING THERMAL ENVELOPE

R402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding 5 air changes per hour (ACH) in Climate Zones ~~1 and 2, and 3 air changes per hour in Climate Zones 3 through 8.~~ 4 and 5. The building or dwelling unit shall be provided with a whole – house mechanical ventilation system as designed in accordance with Section R403.5. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *code official,* a testing shall conducted by an approved third party. A written report of the results of the test, indicating the ACH, shall be signed by the party conducting the test and provided to the *code official.* Testing shall be performed at any time after ~~creation of~~ all penetrations of the *building thermal envelope* have been sealed.
During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures;
3. Interior doors, if installed at the time of the test, shall be open;
4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling systems, if installed at the time of the test, shall be turned off; and
6. Supply and return registers, if installed at the time of the test, shall be fully open.

R402.4.1.3 Visual Inspection Option for Additions, Alterations, Renovations or Repairs. Building envelope tightness and insulation installation shall be considered acceptable when the items in Table R402.4.1.1, applicable to the method of construction, are field verified. Where required by the *code official,* an *approved third* party independent from the installer, shall inspect air barrier and insulation installation.

R403.5 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of this section or the International Mechanical Code, as applicable. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

R403.5.2 Recirculation of air. Exhaust air from bathrooms and toilet rooms shall not be recirculated within a residence or to another *dwelling unit* and shall be exhausted directly to the outdoors. Exhaust air from bathrooms and toilet rooms shall not discharge into an *attic*, crawl space or other areas inside the building.

R403.5.3 Whole-house mechanical ventilation system. Whole-house mechanical ventilation systems shall be designed in accordance with Sections R403.5.4 through R403.5.6.

R403.5.4 System design. The whole-house ventilation system shall consist of one or more supply or exhaust fans, or a combination of such, and associated ducts and controls. Local exhaust or supply fans are permitted to serve as such a system. Outdoor air ducts connected to the return side of an air handler shall be considered to provide supply ventilation.

R403.5.5 System controls. The whole-house mechanical ventilation system shall be provided with controls that enable manual override.

R403.5.6 Mechanical ventilation rate. The whole house mechanical ventilation system shall provide outdoor air at a continuous rate of not less than that determined in accordance with Table R403.5.6(1).

Exception: The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25-percent of each 4-hour segment and the ventilation rate prescribed in Table R403.5.6(1) is multiplied by the factor determined in accordance with Table R403.5.6(2).

R403.5.7 Local exhaust rates. *Local exhaust* systems shall be designed to have the capacity to exhaust the minimum air flow rate determined in accordance with Table R403.5.7.

TABLE R403.5.7
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS

AREA TO BE EXHAUSTED	EXHAUST RATES
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms-Toilet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.0004719 m^3/s.

TABLE R403.5.6(1)
CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0 – 1	2 – 3	4 – 5	6 – 7	> 7
	Airflow in CFM				
≤ 1,500	30	45	60	75	90
1,501 – 3,000	45	60	75	90	105
3,001 – 4,500	60	75	90	105	120
4,501 – 6,000	75	90	105	120	135
6,001 – 7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

For SI: 1 square foot = 0.0929 m^2, 1 cubic foot per minute = 0.0004719 m^3/s.

Page | 6

TABLE R403.5.6(2)
INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS[a, b]

RUN-TIME PERCENTAGE IN EACH 4-HOUR SEGMENT	25%	33%	50%	66%	75%	100%
Factor [a]	4	3	2	1.5	1.3	1.0

a. For ventilation system run time values between those given, the factors are permitted to be determined by interpolation.
b. Extrapolation beyond the table is prohibited.

SECTION R405
SIMULATED PERFORMANCE ALTERNATIVE (PERFORMANCE)

REVISE Table R405.5.2(1), entry for "Air exchange rate" as follows:

STANDARD REFERENCE DESIGN. Air leakage rate of 5 air changes per hour in Climate Zones ~~1 and 2, and 3 air changes per hour in Climate Zones 3 through 8~~ 4 and 5 at a pressure of 0.2 inches w.g (50 Pa). The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than $0.01 \times CFA + 7.5 \times (Nbr + 1)$ where:

CFA = conditioned floor area
Nbr = number of bedrooms
Energy recovery shall not be assumed for mechanical ventilation

Page | 7