ILLINOIS ENERGY CONSERVATION CODE

AMENDMENT PROPOSALS

2018

Contents

COMMERCIAL

C01

Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: C504.2

Office Use Only	
Proposal Number:	C01
Date Submittal Received:	3-27-18

Date:	March 19, 2018
Name:	Bill McHugh
Jurisdiction/Company:	The McHugh Company
Submitted on Behalf of:	Chicago Roofing Contractors Association
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	Hillside, IL 60162
Phone:	708-449-3340
E-Mail:	bill@crca.org

Related Sections Impacted by this Amendment: C504.2

Revise as Follow (in strike-thru / underline format):

C504.2 General. *Buildings* and structures, and parts thereof, shall be repaired in compliance with Section C501.3 and this section. Work on nondamaged components that is necessary for the required *repair* of damaged components shall be considered to be part of the *repair* and shall not be subject to the requirements for *alterations* in this chapter. Routine maintenance required by Section C501.3, ordinary *repairs* exempt from *permit* and abatement of wear due to normal service conditions shall not be subject to the requirements for *repairs* in this section.

Where a building was constructed to comply with ANSI/ASHRAE/IESNA 90.1, repairs shall comply with the standard and need not comply with Sections C402, C403, C404 and C405.

C504.2 Application. For the purposes of this code, the following shall be considered to be repairs:

1. Glass-only replacements in an existing sash and frame.
2. *Roof repairs*.
3. Air barriers shall not be required for *roof repair* where the repairs to the building do not include *alterations*, renovations or *repairs* to the remainder of the building envelope.
4. Replacement of existing doors that separate conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided that an existing vestibule that separates a conditioned space from the exterior shall not be removed.
5. *Repairs* where only the bulb, the ballast or both within the existing luminaires in a space are replaced, provided that the replacement does not increase the installed interior lighting power.
6. For *roof replacement* on existing buildings with a roof slope of less than 2 units vertical in 12 units horizontal (2:12), and where the roof covering is removed and insulation remains, and where the required R-value cannot be provided due to flashing height limitations presented by existing rooftop conditions, (including heating, ventilating and air-conditioning equipment, low door or glazing heights, parapet heights, weep holes, and roof flashing heights not meeting the manufacturer's specifications), the maximum thickness of insulation compatible with the available space and existing uses shall be installed. Insulation used shall be minimum R-3.5 per inch.

Reason:
The purpose of this code proposal is to provide the code official guidance when roofing work takes place on existing buildings. When the scope of work is to replace the roof assembly or roof covering and the flashing heights are too low, the building owner and manager should not have to rebuild the rooftop to accommodate thick roofing components such as insulation.

It takes from 6”-8” of insulation to meet the minimum R-30 continuous insulation required by the 2018 IECC. When the old roof only had 1”-3” of insulation, it means that 5” of insulation might be added to meet the requirement. If the old roof has HVAC Equipment, gas lines, fans, skylights, soil stacks, antennas, or other equipment on the rooftop, then it all has to be raised to get to the 8” minimum heights recommended by the NRCA’s Roofing Manuals. The NRCA documents, while not a standard, are referenced in court during testimony frequently.

Some in the industry state that 5” flashings are done all the time. That’s true. However, should the code be recommending a sub-standard flashing detail? Flashings are where leaks occur most causing insulation to lose its efficiency when water gets in under the roof covering. It should be protected as the objective of the roof is to first, keep the water out.

Cost Impact:
The code change proposal will decrease the cost of construction significantly for older buildings that are having roof replacement or roof recover operations performed.

This code proposal will provide the building owner and manager with the option to not have to rebuild the roof assembly and in some cases, reducing costs. In other cases, it does not provide cost savings.

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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: C504.2

Office Use Only	
Proposal Number:	C02
Date Submittal Received:	3-27-18

Date: March 19, 2018
Name: Bill McHugh
Jurisdiction/Company: The McHugh Company
Submitted on Behalf of: Chicago Roofing Contractors Association
Address: 4415 Harrison St., #540
Hillside, IL 60162
Phone: 708-449-3340
E-Mail: bill@crca.org

Related Sections Impacted by this Amendment:
C504.2

Revise as Follow (in strike-thru / underline format):

C504.1 General. *Buildings* and structures, and parts thereof, shall be repaired in compliance with Section C501.3 and this section. Work on nondamaged components that is necessary for the required *repair* of damaged components shall be considered to be part of the *repair* and shall not be subject to the requirements for *alterations* in this chapter. Routine maintenance required by Section C501.3, ordinary *repairs* exempt from *permit* and abatement of wear due to normal service conditions shall not be subject to the requirements for *repairs* in this section.
Where a building was constructed to comply with ANSI/ASHRAE/IESNA 90.1, repairs shall comply with the standard and need not comply with Sections C402, C403, C404 and C405.
C504.2 Application. For the purposes of this code, the following shall be considered to be repairs:
1. Glass-only replacements in an existing sash and frame.
2. *Roof repairs*.
3. Air barriers shall not be required for *roof repair* where the repairs to the building do not include *alterations*, renovations or *repairs* to the remainder of the building envelope.
4. Replacement of existing doors that separate conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided that an existing vestibule that separates a conditioned space from the exterior shall not be removed.
5. *Repairs* where only the bulb, the ballast or both within the existing luminaires in a space are replaced, provided that the replacement does not increase the installed interior lighting power.
<u>6. Where flashing heights are not minimum 8” above the roof covering surface, a reduction of the required roof assembly insulation thickness shall be allowed to accommodate the limited heights following roof covering manufacturer’s instructions.</u>

Reason:
The purpose of this code proposal is to provide the code official guidance when roofing work takes place on existing buildings. When the scope of work is to replace the roof assembly or roof covering and the flashing heights are too low, the building owner and manager should not have to rebuild the rooftop to accommodate thick roofing components such as insulation.

It takes from 6”-8” of insulation to meet the minimum R-30 continuous insulation required by the 2018 IECC. When the old roof only had 1”-3” of insulation, it means that 5” of insulation might be added to meet the requirement. If the old roof has HVAC Equipment, gas lines, fans, skylights, soil stacks, antennas, or other equipment on the rooftop, then it all has to be raised to get to the 8” minimum heights recommended by the NRCA’s Roofing Manuals. The NRCA documents, while not a standard, are referenced in court during testimony frequently.

Some in the industry state that 5” flashings are done all the time. That’s true. However, should the code be recommending a sub-standard flashing detail? Flashings are where leaks occur most causing insulation to lose its efficiency when water gets in under the roof covering. It should be protected as the objective of the roof is to first, keep the water out.

Cost Impact:
The code change proposal will decrease the cost of construction significantly for older buildings that are having roof replacement or roof recover operations performed.

This code proposal will provide the building owner and manager with the option to not have to rebuild the roof assembly and in some cases, reducing costs. In other cases, it does not provide cost savings.

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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: C504.2

Office Use Only	
Proposal Number:	C03
Date Submittal Received:	3-27-18

Date: March 19, 2018
Name: Bill McHugh
Jurisdiction/Company: The McHugh Company
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Phone: 708-449-3340
E-Mail: bill@crca.org

Related Sections Impacted by this Amendment: C504.2

Revise as Follow (in strike-thru / underline format):

C504.2 General. *Buildings* and structures, and parts thereof, shall be repaired in compliance with Section C501.3 and this section. Work on nondamaged components that is necessary for the required *repair* of damaged components shall be considered to be part of the *repair* and shall not be subject to the requirements for *alterations* in this chapter. Routine maintenance required by Section C501.3, ordinary *repairs* exempt from *permit* and abatement of wear due to normal service conditions shall not be subject to the requirements for *repairs* in this section.

Where a building was constructed to comply with ANSI/ASHRAE/IESNA 90.1, repairs shall comply with the standard and need not comply with Sections C402, C403, C404 and C405.

C504.2 Application. For the purposes of this code, the following shall be considered to be repairs:
1. Glass-only replacements in an existing sash and frame.
2. *Roof repairs*.
3. Air barriers shall not be required for *roof repair* where the repairs to the building do not include *alterations*, renovations or *repairs* to the remainder of the building envelope.
4. Replacement of existing doors that separate conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided that an existing vestibule that separates a conditioned space from the exterior shall not be removed.
5. *Repairs* where only the bulb, the ballast or both within the existing luminaires in a space are replaced, provided that the replacement does not increase the installed interior lighting power.
6. R-value for roof assemblies with tapered insulation above deck with slope greater than 1/8 units vertical in 12 units horizontal (1/8:12) shall provide an average R-20 ci.

Reason:
The purpose of this code proposal is to provide the code official guidance when roofing work takes place on existing buildings. The building owner and manager and designers sometimes uses insulation as a tool to drain the water off a low sloped roof faster than if it were dead flat or very low slope.

When the scope of work is to drain water off the roof and replace the roof covering, and flashing heights are too low, the building owner and manager should not have to rebuild the rooftop to accommodate huge thicknesses of insulation.

It takes from 6”-8” of insulation to meet the minimum R-30 continuous insulation required by the 2018 IECC. When the old roof only had 1”-3” of insulation, it means that 5” of insulation might be added to meet the requirement. If the old roof has HVAC Equipment, gas lines, fans, skylights, soil stacks, antennas, or other equipment on the rooftop, then it all has to be raised to get to the 8” minimum heights recommended by the NRCA’s Roofing Manuals. The NRCA documents, while not a standard, are referenced in court during testimony frequently. The minimum roof insulation thicknesses allowed by the IECC is 1” less than the 5+” of insulation. When starting at 5” thick, there is a lot of extra insulation added to obtain slope to drain, if it is possible at all.

Some in the industry state that 5” flashings are done all the time. That’s true. However, should the code be recommending a sub-standard flashing detail? Flashings are where leaks occur most causing insulation to lose its efficiency when water gets in under the roof covering. It should be protected as the objective of the roof is to first, keep the water out.

Cost Impact:
The code change proposal will decrease the cost of construction for older buildings that are having roof replacement or roof recover operations performed, to provide slope to drain on the roof.

This code proposal will provide the building owner and manager with the option to not have to rebuild the roof assembly and in some cases, reducing costs. In other cases, it does not provide cost savings.

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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: C202, C504.2

Office Use Only	
Proposal Number:	C04
Date Submittal Received:	3-27-18

Date: March 19, 2018
Name: Bill McHugh
Jurisdiction/Company: The McHugh Company
Submitted on Behalf of: Chicago Roofing Contractors Association
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Related Sections Impacted by this Amendment:

Revise as Follow (in strike-thru / underline format):
IECC C202, C504.2.

ADD NEW DEFINITION AS FOLLOWS:

Roof Covering Replacement Where an existing roof covering is removed, exposing insulation or sheathing and only a new roof covering installed.

Reason:
Neither the definitions of Roof Replacement or Roof Covering handle the situation that is described in this new definition. Both definitions invoke the addition of material not scoped in a roof covering peel off and replacement of the roof covering alone. The new definition is needed to provide a clear direction to the code user on situations that are not currently covered by the code. This allows the building owner and manager to remove the existing roof covering, reuse the existing insulation that has much life left in it and replace the roof covering only. There are several applications where this is not only practical, but preferred. In fact, the City of Chicago added a version of this definition to the 2016 Roofing Code Memorandum to their City of Chicago Municipal Code.

Cost Impact
The cost of construction does not increase.

ADD NEW TEXT AS FOLLOWS:

C504.1 General. *Buildings* and structures, and parts thereof, shall be repaired in compliance with Section C501.3 and this section. Work on nondamaged components that is necessary for the required *repair* of damaged components shall be considered to be part of the *repair* and shall not be subject to the requirements for *alterations* in this chapter. Routine maintenance required by Section C501.3, ordinary *repairs* exempt from *permit* and abatement of wear due to normal service conditions shall not be subject to the requirements for *repairs* in this section.
Where a building was constructed to comply with ANSI/ASHRAE/IESNA 90.1, repairs shall comply with the standard and need not comply with Sections C402, C403, C404 and C405.
C504.2 Application. For the purposes of this code, the following shall be considered to be repairs:
1. Glass-only replacements in an existing sash and frame.

2. *Roof repairs*.
3. Air barriers shall not be required for *roof repair* where the repairs to the building do not include *alterations*, renovations or *repairs* to the remainder of the building envelope.
4. Replacement of existing doors that separate conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided that an existing vestibule that separates a conditioned space from the exterior shall not be removed.
5. *Repairs* where only the bulb, the ballast or both within the existing luminaires in a space are replaced, provided that the replacement does not increase the installed interior lighting power
6. Roof Covering Replacement.

Reason:
The purpose of this proposal is to put code language in 504.1 General that ties in with the new proposed definition in section 202 for Roof Covering Replacement. This provides guidance to code users for an area that is not covered at all by the code. This situation, roof covering replacement, is a question that's asked about frequently. This is where the roof covering system life can be extended by adding a new roof covering material alone by 'peeling' off' the old roof covering material and replacing it with new roof covering material. There are situations where this method is not only practical but preferred. In fact, the City of Chicago added this definition through its 2016 Roofing Memorandum and allows the method through the memorandum.

Cost Impact
The code change proposal will not increase the cost of construction. This code proposal provides an option not available to the building owner and manager.

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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: C405.1 General

Office Use Only	
Proposal Number:	C05
Date Submittal Received:	3-31-18

Date: March 28, 2018
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Jurisdiction/Company: New Buildings Institute
Submitted on Behalf of: New Buildings Institute
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Orland Park, IL 60462
Phone: 208 863-6924
E-Mail: EricM@newbuildings.org

Related Sections Impacted by this Amendment:

C405.1 General (Mandatory)

Revise as Follow (in strike-thru / underline format):

C405.1 General (Mandatory). This section covers lighting system controls, the maximum lighting power for interior and exterior applications and electrical energy consumption.

No less than 90% of the permanently installed lighting serving dwelling units shall be provided by lamps with an efficacy of not less than 65 lm/W or light fixtures with an efficacy of not less than 55 lm/W, or with Sections C405.2.4 and C405.3. ~~*Dwelling units* within multifamily buildings shall comply with Section R404.1. All other *dwelling units* shall comply with Section R404.1, or with Sections C405.2.4 and C405.3.~~ *Sleeping units* shall comply with Section C405.2.4, and with Section R404.1 or C405.3. Lighting installed in walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with the lighting requirements of Section C403.10.1 or C403.10.2.

Reason:

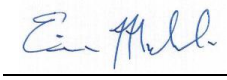
This proposal replaces a reference to the residential code for lighting efficacy in multifamily dwelling units with a specific lighting efficacy requirement. The referenced residential code sections for dwelling unit lighting include a requirement for "high efficiency lamps." However, the definition of "high efficacy lamps" has not been updated to reflect the changes in the market due to increased federal minimums and greater viability /affordability of LED lighting. Because of this, the code is actually becoming less stringent as the baseline for lighting equipment is raised. The proposal solves this problem by replacing the reference to the residential lamp efficacy requirements with built-in lighting requirements that reflect what is actually "high-efficacy" in today's market. The proposal also simplifies the requirement by reducing the number of wattage categories. The categories in the residential code are an artifact of incandescent and early compact fluorescent lamp wattages. As lamps have gotten more efficient, the higher wattage categories have become less meaningful.

Dwelling units will still have the option to use the LPD calculation of the building. This is better because it creates greater flexibility, allowing either a lamp efficacy or LPD approach. This is important considering that dwelling unit

lighting does not always lend itself well to LPD requirements. Dwelling units often include a number of smaller spaces, a configuration that tends to increase LPD levels with the same lamp efficacy.

Cost Impact:

This change will increase the cost of construction. A study of the impact of this requirement plus tighter common area LPD requirements on a mid-rise building put the incremental cost for Portland at about $0.24/sf. The incremental cost for this requirement would be somewhat lower since it does not include the cost of improved common area lighting efficiency. However, that same measure saved about 1% of total building energy in mid- and high-rise buildings.

Signature (for release of copyrights): 

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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: Table C402.4

Office Use Only	
Proposal Number:	C06
Date Submittal Received:	3-31-18

Date: March 28, 2018
Name: Eric Makela
Jurisdiction/Company: New Buildings Institute
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Phone: 208 863-6924
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Related Sections Impacted by this Amendment:

Table C402.4 Building Envelope Fenestration Maximum U-Factor and SHGC Requirements

Revise as Follow (in strike-thru / underline format):

Delete Table C402.4 and replace with new Table C402.4

Table C402.4
Building Envelope Fenestration Maximum U-Factor and SHGC Requirements

CLIMATE ZONE	4	5
Vertical Fenestration		
U-Factor		
Windows rated in accordance with AAMA/WDMA/CSA 101/I.S/A440[A] (Class AW windows) and curtain walls		
Fixed fenestration	0.36	0.36
Operable fenestration	0.43	0.43
All other vertical fenestration		
All fenestration	0.30	0.27
Entrance doors	0.77	0.77
SHGC		
All Projection Factors	0.35	0.35
Skylights		
U-Factor	0.48	0.48
SHGC	0.38	0.38
[A] Curtain wall, window wall, and storefront fenestration shall comply with the U-factor and SHGC requirements for Class AW fixed windows.		

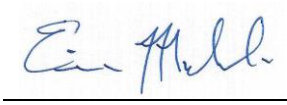
Reason:

The proposal replaces the fenestration table with a table that divides different types of window requirements in a way that is more reasonable and equitable than the current table and updates the requirements to more efficient values. Instead of using material as the dividing factor in the table, this proposal uses construction factors. It provides a separate, less stringent requirement for curtain wall and Class AW windows. These are windows where the frames must play a structural role beyond what is seen in typical "punched opening" windows. This is why meeting more stringent requirements is often not feasible or cost effective for these
windows; they must meet those requirements while also meeting structural requirements and the solutions that can do both are more costly than the solutions that just improve energy performance.

The current table divides windows by material type, with less stringent requirements for metal windows. However, the only type of metal windows that actually struggle to meet the more stringent requirements are large "Class AW" architectural windows like picture windows, and curtain wall systems where frames must meet a structural load. "Punched opening" metal windows can meet the same requirements as other materials since they do not have frames that need to meet the same kind of structural load as these other types of metal windows. This table only allows curtain wall windows and rated "Class AW" windows to use the less stringent requirement. It maintains the less stringent requirement for window types where meeting the more stringent requirements would require costly materials or construction, while maintaining the more stringent requirement metal windows that are not so restrained by feasibility. The Class AW designation comes from the AAMA/CSA 101/I.S.2/A440 ANSI Standard. The 2018 edition of the IECC has almost no improvement in the requirements for windows, with only a small improvement in SHGC values. This creates a significant missed opportunity for efficiency in Illinois. The proposed table updates the U-factor requirements based on requirements that are being incorporated into the New York State Stretch Energy Code.

Cost Impact:

This change will increase cost. Re-categorizing may result in some limited cost increase, but that will be due to eliminating what was effectively a loophole in the code. A cost study for the increased stringency found a $0.62/sf incremental cost for a 6-story mid-rise multifamily building in Portland with 20% window to wall ratio. Windows are key to the thermal performance of the buildings and making this change will allow the energy code to better meet its goal of conserving energy.



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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: New C404.2.2

Office Use Only	
Proposal Number:	C07
Date Submittal Received:	3-31-18

Date: March 28, 2018
Name: Eric Makela
Jurisdiction/Company: New Buildings Institute
Submitted on Behalf of: New Buildings Institute
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Orland Park, IL 60462
Phone: 208 863-6924
E-Mail: EricM@newbuildings.org

Related Sections Impacted by this Amendment:

New Section: **C404.2.2 High input domestic water heating systems.**

Revise as Follow (in strike-thru / underline format):

C404.2.2 High input domestic water heating systems. In new buildings, not less than 40% of the annual service water-heating requirement serving residential occupancies, commercial kitchens and laundries shall be provided by on-site renewable energy or site-recovered energy.

Reason:

This proposal improves the overall efficiency of hot water systems in R-1 and -2 occupancies. It does this by introducing a requirement to incorporate any combination of renewable energy, waste heat recovery or solar thermal equipment sized to provide 40% of the total water-heating load for the dwelling or sleeping units, commercial kitchens and laundries.

Water heating is one of the largest loads in R-1 (hotels) and R-2 (multifamily) occupancies. It composes around 30% of the total building load in typical multifamily buildings. It therefore represents a tremendous opportunity to improve the efficiency of these occupancies. Utilities are second only to rent in determining actual housing affordability. Unfortunately, water heating equipment efficiency set at the federal level, so greater efficiency cannot be gained through tightening those requirements. The code has done far less to address how hot water loads in these residential occupancies than it has done for other aspects of building efficiency such as HVAC and lighting. When this requirement was modeled for the New York Stretch Energy Code, it resulted in 12-13% savings for a 10-story apartment prototype. Given the more moderate climate in Illinois, savings would be greater as water heating is a higher percentage of the total building load in more temperate climates.

This new requirement will significantly increase the efficiency of this critical load. It is worded to provide significant flexibility for compliance and is narrowly defined so that it only applies to the buildings types where it can generate significant savings.

Cost Impact:

This proposal will increase first cost. However it also leads to considerable savings in operating costs and is necessary to conserve scarce resources. Based on a study for the Minnesota A final report for the Minnesota Department of Commerce for a multifamily building the installed cost for a heat recovery system was approximately $2,500.

https://www.seventhwave.org/sites/default/files/272-1.pdf

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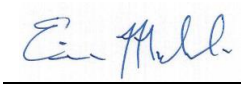
Signature (for release of copyrights): 

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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: C405.2.1

Office Use Only	
Proposal Number:	C08
Date Submittal Received:	3-31-18

Date: March 28, 2018
Name: Eric Makela
Jurisdiction/Company: New Buildings Institute
Submitted on Behalf of: New Buildings Institute
Address: 9750 Crescent Park Circle
Orland Park, IL 60462
Phone: 208 863-6924
E-Mail: EricM@newbuildings.org

Related Sections Impacted by this Amendment:

C405.2.1 Occupant sensor controls

Revise as Follow (in strike-thru / underline format):

C405.2.1 Occupant sensor controls. Occupant *sensor controls* shall be installed to control lights in the following space types:
1. Classrooms/lecture/training rooms.
2. Conference/meeting/multipurpose rooms.
3. Copy/print rooms.
4. Corridor/transition areas
5. Dining areas
~~4~~6. Lounges/breakrooms
~~5~~7. Enclosed offices.
~~6~~8. Open plan office areas.
~~7~~9. Restrooms.
~~8~~10. Storage rooms
~~9~~11. Locker rooms.
~~10~~12. Other spaces 300 square feet (28 m2) or less that are enclosed by floor-to-ceiling height partitions.
~~11~~13. Warehouse storage areas.

Reason:

This proposal expands the list of spaces subject to the occupancy controls in the code. These additional spaces include corridors, dining areas, employee break and lunch rooms, stairways, janitorial closets and playing areas. Occupancy controls are an effective means of saving energy. However, the code only requires them in a limited set of space types and conditions, leaving a significant opportunity for energy savings.

The proposal adds additional spaces to the list of spaces where occupancy controls are required. As occupancy controls have improved, have gained greater market acceptance, have become more proven and have gotten less costly, they have become an appropriate solution for more space types.

Cost Impact:

This requirement does increase the cost of construction. The requirement however saves additional energy by providing more automatic control of spaces in commercial buildings. Cost vary by building type and are difficult to assess except on a case-by-case basis. Incremental costs for the occupancy control of a single space can be as low as $20 per control. The requirement only addresses spaces above the size threshold in code, so the incremental cost would be no more than $.07/sf for affected space types.

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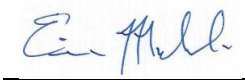
Signature (for release of copyrights): 

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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: New C405.2.1.4

Office Use Only	
Proposal Number:	C09
Date Submittal Received:	3-31-18

Date: March 28, 2018
Name: Eric Makela
Jurisdiction/Company: New Buildings Institute
Submitted on Behalf of: New Buildings Institute
Address: 9750 Crescent Park Circle
Orland Park, IL 60462
Phone: 208 863-6924
E-Mail: EricM@newbuildings.org

Related Sections Impacted by this Amendment:

New Section: **Section C405.2.1.4 Occupant sensor control function for egress illumination**

Revise as Follow (in strike-thru / underline format):

Section C405.2.1.4 Occupant sensor control function for egress illumination. In new buildings, luminaires serving the exit access and providing means of egress illumination required by Section 1006.1 of the International Building Code, including luminaires that function as both normal and emergency means of egress illumination shall be controlled by a combination of listed emergency relay and occupancy sensors, or signal from another building control system, that automatically shuts off the lighting when the areas served by that illumination are unoccupied.

> **Exception:** Means of egress illumination serving the exit access that does not exceed 0.02 watts per square foot of building area is exempt from this requirement.

Reason:

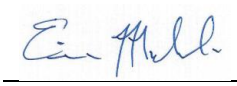
Egress lighting has historically been exempted from control requirements in the code. This results in significant portions of the lighting in the building being uncontrolled and even continuously on. It is a significant use of energy and it does not enhance life-safety since it can result in providing more lighting than necessary during nonemergency situations.

The proposal specifically requires occupancy controls for egress lighting. Minimum egress lighting provisions in the International Building Code do not require nearly the light levels needed for typical use. So simply keeping general illumination on all the time results in a significant energy waste without an enhancement to protection of life-safety. Advancements in occupancy control requirements and improvements in the acceptance testing requirements of the code have made occupancy control along the egress path a viable option. Additionally, this proposal requires that the lighting be reduced to the levels required for egress, not turned off. Therefore, even in the case of occupancy control failure, there is no risk to life safety since light can always be left on to minimum levels required for egress. This will also ensure that photo-luminescent strips (if utilized) remain charged at all times. The requirement includes an exception for egress lighting that does not exceed .02 W/sf. This is the LPD level that will generally result in lighting that meets the egress requirements of IBC without providing general use lighting. It is also the level of lighting needed to keep luminescent lighting strips charged. This ensures that low power, egress-specific lighting systems and

solutions are not subject to this requirement. Note that this requirement is part of ASHRAE Standard 90.1-2016. This proposal was also developed with input from members from the Illuminating Engineers Society of North America and New York State fire officials.

Cost Impact:

This proposal will increase the cost of construction but but will result in energy savings by reducing the lighting levels as egress lighting is often on at full power at all times. Cost vary by building type and are difficult to assess except on a case-by-case basis. Incremental costs for the occupancy control of a single space can be as low as $20 per control. Controlling this load is one way for the code to meet its goal of effectively conserving scarce energy resources.

Signature (for release of copyrights): 

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RESIDENTIAL

R01

Public Code Change Proposal Form
To Amend the 2018 Illinois Energy Conservation Code

Code Section: R202, R503.1.1

Office Use Only	
Proposal Number:	R01
Date Submittal Received:	3-27-18

Date: January 9, 2018
Name: Bill McHugh
Jurisdiction/Company: The McHugh Company
Submitted on Behalf of: Chicago Roofing Contractors Association
Address: 4415 Harrison St., #540
Hillside, IL 60162
Phone: 708-449-3340
E-Mail: bill@crca.org

Related Sections Impacted by this Amendment:

Revise as Follow (in strike-thru / underline format):
IECC R202, R503.1.1

ADD NEW DEFINITION AS FOLLOWS:

Roof Covering Replacement Where an existing roof covering is removed, exposing insulation or sheathing and only a new roof covering installed.

Reason:
Neither the definitions of Roof Replacement or Roof Covering handle the situation that is described in this new definition. Both definitions invoke the addition of material not scoped in a roof covering peel off and replacement of the roof covering alone. The new definition is needed to provide a clear direction to the code user on situations that are not currently covered by the code. This allows the building owner and manager to remove the existing roof covering, reuse the existing insulation that has much life left in it and replace the roof covering only. There are several applications where this is not only practical, but preferred. In fact, the City of Chicago added a version of this definition to the 2016 Roofing Code Memorandum to their City of Chicago Municipal Code.

Cost Impact
The code change proposal will not increase or decrease the cost of construction. This new definition actually provides an option to the building owner and manager that reduces the cost of construction where the rest of the roof assembly components are reused. In other cases, the cost of construction does not increase.

ADD NEW TEXT AS FOLLOWS:

R503.1 General. *Alterations* to any *building* or structure shall comply with the requirements of the code for new construction. *Alterations* shall be such that the existing *building* or structure is not less conforming to the provisions of this code than the existing *building* or structure was prior to the *alteration*. *Alterations* 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 portions of the existing *building* or *building* system to comply with this code. *Alterations* shall not create an unsafe or hazardous condition or overload *existing* building systems. *Alterations* shall be such that the

existing *building* or structure does not use more energy than the existing *building* or structure prior to the *alteration*. *Alterations* to existing *buildings* shall comply with Sections R503.1.1 through R503.2.

R503.1.1 Building envelope. *Building* envelope assemblies that are part of the *alteration* shall comply with Section R402.1.2 or R402.1.4, Sections R402.2.1 through R402.2.13, R402.3.1, R402.3.2, R402.4.3 and R402.4.5.
Exception: The following *alterations* shall not be required to comply with the requirements for new construction provided that the energy use of the *building* is not increased:
1. Storm windows installed over existing fenestration.
2. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are filled with insulation.
3. Construction where the existing roof, wall or floor cavity is not exposed.
4. Roof re-cover.
5. 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. Surface-applied window film installed on existing single pane fenestration assemblies to reduce solar heat gain provided that the code does not require the glazing or fenestration assembly to be replaced.
7. Roof Covering Replacement.

Reason:
The purpose of this proposal is to put code language in 504.1 General that ties in with the new definition in section 202 for Roof Covering Replacement. This provides guidance to code users for an area that is not covered at all by the code. This situation, roof covering replacement, is a question that's asked about frequently. This is where the roof covering system life can be extended by adding a new roof covering material alone by 'peeling' off' the old roof covering material. There are situations where this method is not only practical but preferred. In fact, the City of Chicago added this definition through its 2016 Roofing Memorandum and allows the method through the memorandum.

Cost Impact
The code change proposal will not increase or decrease the cost of construction. This code proposal provides an option not available to the building owner and manager. The result is it will be no increase in the cost of construction where or a big savings in cost due to not having to rework the roof assembly to accommodate roofing component thicknesses.

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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: R402.4.1.2

Office Use Only	
Proposal Number:	R02a
Date Submittal Received:	3-30-18 4:26pm

Date:	March 30, 2018
Name:	Tony Holub
Jurisdiction/Company:	Passive House Alliance
Submitted on Behalf of:	
Address:	53 W Jackson Blvd Suite 650
	Chicago IL 60604
Phone:	(312) 622-4244
E-Mail:	tony@farrside.com

Related Sections Impacted by this Amendment:

R402.4.1.2 Testing

Revise as Follow (in strike-thru / underline format):

The building or dwelling unit shall be testing and verified as having an air leakage rate not exceeding five air changes per hour in Climate Zones 1 and 2, and ~~three~~ **two** air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals).

Reason:

Thank you for the opportunity to provide comments on the update to the 2018 International Energy Conservation Code (IECC) as the statewide energy code in Illinois. The Passive House Alliance US, Chicago Chapter (PHAUS) is a member-based non-profit organization that promotes the Passive House high performance building standard to create structures that meet a rigorous level of energy efficiency in accordance with building-science principles, including an airtight building envelope.

For the purpose of adoption of the 2018 IECC we recommend the air tightness requirement in Section R402.4.1.2 Testing section be amended to 2.0 ACH_{50} from 3.0 ACH_{50}. This represents adequate progress toward a preferable air-tightness limit.

Air leakage is responsible for 15% to 25% of energy use in a built to code home in Illinois. It also impacts indoor air quality, moisture management within assemblies, and longevity of the structure. Therefore reducing air infiltration is an achievable way to improve energy efficiency, health and comfort, and quality construction.

2018 IECC R402.4.1.2 Testing requirement of three air changes per hour in Climate Zones 3 through 8 is achievable through standard building practices and assemblies. A recent statewide analysis of HERS rated homes shows that 87% of all HERS rated single-family homes meet or exceed an air leakage rate of 3.0. Often homes achieve significantly better performance. Builders are meeting and in most cases exceeding the 3.0 ACH50 requirement, and have found cost effective ways to do so. It should be noted that the US Army Corps

commissioned a study resulting in their adoption of an air leakage limit of 0.15 ACH_{50} (0.25 ACH_{75}). They determined this level of air tightness was achievable with desirable ROI. Let it be known that buildings built to the Passive House Institute PHIUS+ certification standard must achieve a limit of 0.06 ACH_{50} (0.5 cfm/sf). While this limit is demanding, an increasing number of projects are achieving this mark. Additionally, we advocate for allowing an alternate compliance path using a surface-area based target (CFM50/FT2) in lieu of the current volumetric requirement (ACH50). The building science community has recognized the need to addresses air leakage relative to the building envelope especially in low-rise multifamily construction.

As with any code or regulation it is only as good as the enforcement. Unfortunately, many projects are not meeting the current minimum energy code requirements in Illinois. PHAUS advocates for improved 2018 IECC code enforcement and is interested in working with the Advisory Council to explore ways to more effectively ensure enforcement. We welcome the opportunity to participate in a task force with CDB to address this issue in a manner that doesn't place any undue burden on the builders, owners, designers, or code officials.

PHAUS promotes a wholistic approach to designing and building durable, resilient, comfortable, healthy, and super energy efficient buildings. Building airtightness alone can save energy; however, it cannot ensure healthy indoor air quality. Leaky homes rely on air infiltration for fresh air. This is a flawed approach to ensuring adequate indoor air quality as there is no way to accurately control the amount of outdoor air delivered, where it is delivered to, and where the air is drawn from. It relies on air pressure differential from wind and stack effect to draw air in. Because it is uncontrolled, the air can be drawn through insulation thereby lowering the effective R-value of the assembly, and it carries a significant amount of moisture which often causes moisture and mold issues. Also, the air may be drawn in from garages, crawlspaces, or combustion sources;, bringing along harmful gases and pollutants into the interior environment. **Along with improved air sealing, we recommend indoor air quality systems to provide fresh air while removing pollutants.**

If you have any questions about our position, noted references please contact Tony Holub President, Passive House Alliance US Chicago Chapter President at tony@farrside.com or 312-408-1661 x214.

Sincerely,

Tony Holub President, Passive House Alliance US Chicago Chapter

Cost Impact:

Additional costs are limited to the expense for builders to ensure the air barrier system (already required by the IECC 2018) is installed according to the manufacturer's recommendations, and per guidance from the Air Barrier Association of America, and that penetrations are properly sealed.

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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: R402.4.1.2

Office Use Only	
Proposal Number:	R02b
Date Submittal Received:	3-30-18 5:14pm

Date: March 30, 2018
Name: Michael Schaefer
Jurisdiction/Company:
Submitted on Behalf of:
Address: 3909 Farmstead Lane
Carpentersville, IL 60110
Phone: 224-239-4938
E-Mail: mschaefer@hvac.mea.com

Related Sections Impacted by this Amendment:

R402.4.1.2 Testing

Revise as Follow (in strike-thru / underline format):

The building or dwelling unit shall be testing and verified as having an air leakage rate not exceeding five air changes per hour in Climate Zones 1 and 2, and ~~three~~ **two** air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals).

Reason:

For the purpose of adoption of the 2018 IECC I propose the air tightness requirement in Section R402.4.1.2 Testing section be amended to 2.0 ACH_{50} from 3.0 ACH_{50}. This represents adequate progress toward a preferable air-tightness limit.

Air leakage is responsible for 15% to 25% of energy use in a built to code home in Illinois. It also impacts indoor air quality, moisture management within assemblies, and longevity of the structure. Therefor reducing air infiltration is an achievable way to improve energy efficiency, health and comfort, and quality construction.

2018 IECC R402.4.1.2 Testing requirement of three air changes per hour in Climate Zones 3 through 8 is achievable through standard building practices and assemblies. A recent statewide analysis of HERS rated homes shows that 87% of all HERS rated single-family homes meet or exceed an air leakage rate of 3.0. Often homes achieve significantly better performance. Builders are meeting and in most cases exceeding the 3.0 ACH50 requirement, and have found cost effective ways to do so. It should be noted that the US Army Corps commissioned a study resulting in their adoption of an air leakage limit of 0.15 ACH_{50} (0.25 ACH_{75}). They determined this level of air tightness was achievable with desirable ROI. Let it be known that buildings built to the Passive House Institute PHIUS+ certification standard must achieve a limit of 0.06 ACH_{50} (0.5 cfm/sf). While this limit is demanding, an increasing number of projects are achieving this mark. Additionally, we advocate for allowing an alternate compliance path using a surface-area based target (CFM50/FT2) in lieu of the current volumetric requirement (ACH50). The building science community has recognized the need to addresses air leakage relative to the building envelope especially in low-rise multifamily construction.

As with any code or regulation it is only as good as the enforcement. Unfortunately, many projects are not meeting the current minimum energy code requirements in Illinois. I believe that the building industry would be benefited from consistent code enforcement.

Building airtightness alone can save energy; however, it cannot ensure healthy indoor air quality. Leaky homes rely on air infiltration for fresh air. This is a flawed approach to ensuring adequate indoor air quality as there is no way to accurately control the amount of outdoor air delivered, where it is delivered to, and where the air is drawn from. It relies on air pressure differential from wind and stack effect to draw air in. Because it is uncontrolled, the air can be drawn through insulation thereby lowering the effective R-value of the assembly, and it carries a significant amount of moisture which often causes moisture and mold issues. Also, the air may be drawn in from garages, crawlspaces, or combustion sources; bringing along harmful gases and pollutants into the interior environment. **Along with improved air sealing, I recommend indoor air quality systems to provide fresh air while removing pollutants.**

Cost Impact:

Additional costs are limited to the expense for builders to ensure the air barrier system (already required by the IECC 2018) is installed according to the manufacturer's recommendations, and per guidance from the Air Barrier Association of America, and that penetrations are properly sealed.

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Signature (for release of copyrights): Michael A. Schaefer 3/30/18

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R02c

Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: R402.4.1.2

Office Use Only	
Proposal Number:	R02c
Date Submittal Received:	3:30-18 8:57pm

Date: March 30, 2018
Name: Alvin Meroz
Jurisdiction/Company:
Submitted on Behalf of:
Address: 5718 S. Kenneth Ave.
Chicago, Illinois 60629
Phone: 773-683-9270
E-Mail: Alvin8059@gmail.com

Related Sections Impacted by this Amendment:

R402.4.1.2 Testing

Revise as Follow (in strike-thru / underline format):

The building or dwelling unit shall be testing and verified as having an air leakage rate not exceeding five air changes per hour in Climate Zones 1 and 2, and ~~three~~ **two** air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals).

Reason:

For the purpose of adoption of the 2018 IECC I propose the air tightness requirement in Section R402.4.1.2 Testing section be amended to 2.0 ACH50 from 3.0 ACH50. This represents adequate progress toward a preferable air-tightness limit.
Air leakage is responsible for 15% to 25% of energy use in a built to code home in Illinois. It also impacts indoor air quality, moisture management within assemblies, and longevity of the structure. Therefor reducing air infiltration is an achievable way to improve energy efficiency, health and comfort, and quality construction.
2018 IECC R402.4.1.2 Testing requirement of three air changes per hour in Climate Zones 3 through 8 is achievable through standard building practices and assemblies. A recent statewide analysis of HERS rated homes shows that 87% of all HERS rated single-family homes meet or exceed an air leakage rate of 3.0. Often homes achieve significantly better performance. Builders are meeting and in most cases exceeding the 3.0 ACH50 requirement, and have found cost effective ways to do so. It should be noted that the US Army Corps commissioned a study resulting in their adoption of an air leakage limit of 0.15 ACH50 (0.25 ACH75). They determined this level of air tightness was achievable with desirable ROI. Let it be known that buildings built to the Passive House Institute PHIUS+ certification standard must achieve a limit of 0.06 ACH50 (0.5 cfm/sf). While this limit is demanding, an increasing number of projects are achieving this mark. Additionally, we advocate for allowing an alternate compliance path using a surface-area based target (CFM50/FT2) in lieu of the current volumetric requirement (ACH50). The building science community has recognized the need to addresses air leakage relative to the building envelope especially in low-rise multifamily construction.

As with any code or regulation it is only as good as the enforcement. Unfortunately, many projects are not meeting the current minimum energy code requirements in Illinois. I believe that the building industry would be benefited from consistent code enforcement.
Building airtightness alone can save energy; however, it cannot ensure healthy indoor air quality. Leaky homes rely on air infiltration for fresh air. This is a flawed approach to ensuring adequate indoor air quality as there is no way to accurately control the amount of outdoor air delivered, where it is delivered to, and where the air is drawn from. It relies on air pressure differential from wind and stack effect to draw

air in. Because it is uncontrolled, the air can be drawn through insulation thereby lowering the effective R-value of the assembly, and it carries a significant amount of moisture which often causes moisture and mold issues. Also, the air may be drawn in from garages, crawlspaces, or combustion sources; bringing along harmful gases and pollutants into the interior environment. **Along with improved air sealing, I recommend indoor air quality systems to provide fresh air while removing pollutants.**

Cost Impact:

Additional costs are limited to the expense for builders to ensure the air barrier system (already required by the IECC 2018) is installed according to the manufacturer's recommendations, and per guidance from the Air Barrier Association of America, and that penetrations are properly sealed.

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Signature (for release of copyrights): Alvin Meroz

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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: R402.4.1.2

Office Use Only	
Proposal Number:	R02d
Date Submittal Received:	3-31-18 2:52pm

Date:	March 30, 2018
Name:	Tim Zelazny, RA, CPHC, BECxP
Jurisdiction/Company:	ESD Global
Submitted on Behalf of:	ESD Global
Address:	175 W Jackson, Suite 1400, Chicago, IL 60604
Phone:	312.456.2264
E-Mail:	TZelazny@esdglobal.com

Related Sections Impacted by this Amendment:

R402.4.1.2 Testing

Revise as Follow (in strike-thru / underline format):

The building or dwelling unit shall be testing and verified as having an air leakage rate not exceeding five air changes per hour in Climate Zones 1 and 2, and ~~three~~ **two** air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals).

Reason:

For the purpose of adoption of the 2018 IECC I propose the air tightness requirement in Section R402.4.1.2 Testing section be amended to 2.0 ACH_{50} from 3.0 ACH_{50}. This represents adequate progress toward a preferable air-tightness limit.

Air leakage is responsible for 15% to 25% of energy use in a built to code home in Illinois. It also impacts indoor air quality, moisture management within assemblies, and longevity of the structure. Therefor reducing air infiltration is an achievable way to improve energy efficiency, health and comfort, and quality construction.

2018 IECC R402.4.1.2 Testing requirement of three air changes per hour in Climate Zones 3 through 8 is achievable through standard building practices and assemblies. A recent statewide analysis of HERS rated homes shows that 87% of all HERS rated single-family homes meet or exceed an air leakage rate of 3.0. Often homes achieve significantly better performance. Builders are meeting and in most cases exceeding the 3.0 ACH50 requirement, and have found cost effective ways to do so. It should be noted that the US Army Corps commissioned a study resulting in their adoption of an air leakage limit of 0.15 ACH_{50} (0.25 ACH_{75}). They determined this level of air tightness was achievable with desirable ROI. Let it be known that buildings built to the Passive House Institute PHIUS+ certification standard must achieve a limit of 0.06 ACH_{50} (0.5 cfm/sf). While this limit is demanding, an increasing number of projects are achieving this mark. Additionally, we advocate for allowing an alternate compliance path using a surface-area based target (CFM50/FT2) in lieu of the current volumetric requirement (ACH50). The building science community has recognized the need to addresses air leakage relative to the building envelope especially in low-rise multifamily construction.

As with any code or regulation it is only as good as the enforcement. Unfortunately, many projects are not meeting the current minimum energy code requirements in Illinois. I believe that the building industry would be benefited from consistent code enforcement.

Building airtightness alone can save energy; however, it cannot ensure healthy indoor air quality. Leaky homes rely on air infiltration for fresh air. This is a flawed approach to ensuring adequate indoor air quality as there is no way to accurately control the amount of outdoor air delivered, where it is delivered to, and where the air is drawn from. It relies on air pressure differential from wind and stack effect to draw air in. Because it is uncontrolled, the air can be drawn through insulation thereby lowering the effective R-value of the assembly, and it carries a significant amount of moisture which often causes moisture and mold issues. Also, the air may be drawn in from garages, crawlspaces, or combustion sources; bringing along harmful gases and pollutants into the interior environment. **Along with improved air sealing, I recommend indoor air quality systems to provide fresh air while removing pollutants.**

Cost Impact:

Additional costs are limited to the expense for builders to ensure the air barrier system (already required by the IECC 2018) is installed according to the manufacturer's recommendations, and per guidance from the Air Barrier Association of America, and that penetrations are properly sealed.

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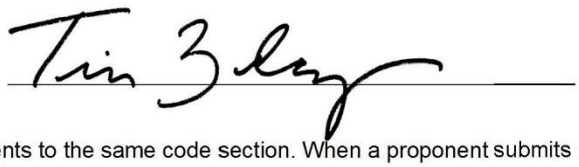
Signature (for release of copyrights): 

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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: R403.3

Office Use Only	
Proposal Number:	R03
Date Submittal Received:	3-31-18 12:22pm

Date: 3/31/2018
Name: Darren Meyers, P.E.
Jurisdiction/Company: International Energy Conservation Consultants, LLC
Submitted on Behalf of: Self
Address: 7877 Marquette Dr. S.
Tinley Park, IL 60477
Phone: (708) 790-4602
E-Mail: dmeyers@ieccode.com

Related Sections Impacted by this Amendment:
ILECC-R, 2018

R403.3, R403.3.3

Revise as Follows (in strike-thru / underline format):

R403.3 Ducts. Ducts and air handlers shall be insulated, sealed, tested and installed in accordance with Sections R403.3.1 through R403.3.7. Where required by the *code official*, duct testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*.

R403.3.3 Duct testing (Mandatory). Ducts shall be pressure tested to determine air leakage by one of the following methods:

1. Rough-in test: Total leakage shall be measured with a pressure differential of 0.1-inch w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. All registers shall be taped or otherwise sealed during the test.

2. Postconstruction test: Total leakage shall be measured with a pressure differential of 0.1-inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. Registers shall be taped or otherwise sealed during the test.

Exceptions:

1. A duct air leakage test shall not be required where the ducts and air handlers are located entirely within the *building thermal envelope*.

2. A duct air-leakage test shall not be required for ducts serving heat or energy recovery ventilators that are not integrated with the ducts serving heating or cooling systems.

~~A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*.~~

Reason: Should builders, engineers, HVAC, or home performance contractors be allowed to test their own work without *approval*? The "hanging" sentence located at the end of R403.3.3 (after exceptions and often missed) is relocated as charging language to the "parent" section.

Cost Impact: No impact. Fees for testing are paid to the contractor performing the work regardless.

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Signature (for release of copyrights): Darren B. Meyers, P.E.

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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: R202

Office Use Only	
Proposal Number:	R04
Date Submittal Received:	3-31-18 3:02pm

Date: March 28, 2018
Name: Eric Makela
Jurisdiction/Company: New Buildings Institute
Submitted on Behalf of: New Buildings Institute
Address: 9750 Crescent Park Circle
Orland Park, IL 60462
Phone: 208 863-6924
E-Mail: EricM@newbuildings.org

Related Sections Impacted by this Amendment:

Section R202 – General Definitions

Revise as Follow (in strike-thru / underline format):

HIGH-EFFICACY LAMPS. Compact fluorescent lamps, light-emitting diode (LED) lamps, T-8 or smaller diameter linear fluorescent lamps, or other lamps with an efficacy of not less than ~~the following:~~ 65 lumens per watt or light fixtures of not less than 55 lumens per watt.

~~1. 60 lumens per watt for lamps over 40 watts.~~
~~2. 50 lumens per watt for lamps over 15 watts to 40 watts.~~
~~3. 40 lumens per watt for lamps 15 watts or less.~~

Reason:
The referenced residential code sections for dwelling unit lighting include a requirement for "high efficiency lamps." However, the definition of "high efficacy lamps" has not been updated to reflect the changes in the market due to increased federal minimums and greater availability/affordability of LED lighting. Because of this, the code is actually becoming less stringent as the baseline for lighting equipment is raised.

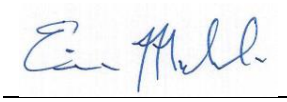
The proposal solves this problem by replacing the reference to the residential lamp efficacy requirements with built-in lighting requirements that reflect what is actually "high-efficacy" in today's market. The proposal also simplifies the requirement by reducing the number of wattage categories. The categories in the residential code an artifact of incandescent and early compact fluorescent lamp wattages. As lamps have gotten more efficient, the higher wattage categories have become less meaningful.

This proposal was developed with input from members of the Illuminating Engineering Society (this should not be taken as endorsement of this proposal by IESNA)

Cost Impact:

This change will increase the cost of construction because it requires higher efficacy lighting (lamps and/or fixtures), which will likely eliminate some lower-end CFL options and/or push builders to newer LED technologies. The cost of LEDs has been steadily declining over the last several years and is expected to continue to decline. Based on an analysis by the U.S. Department of Energy's Building Energy Codes Program conducted during the 2018 IECC Code Development cycle, the estimated and projected prices for LEDs were $4.84 per lamp compared to CFLs at $3.10 per lamp so would result in a slight price increase.

Based on U.S. DOE studies, the cost savings by replacing all of the CFLs with higher efficacy LED lighting saves approximately $6 per year per dwelling unit in overall regulated energy costs. This change will also positively impact mid- and high-rise residential lighting as those dwelling units are required to comply with the low-rise high efficacy lighting requirements.

Signature (for release of copyrights): 

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Public Code Change Proposal Form

To Amend the 2018 Illinois Energy Conservation Code

Code Section: R402.4.1.2

Office Use Only	
Proposal Number:	R05
Date Submittal Received:	3-31-18

Date:	March 30, 2018
Name:	Lindsey Elton
Jurisdiction/Company:	Eco Achievers
Submitted on Behalf of:	Affordable Housing Developers
Address:	1647 W Fulton St
	Chicago, IL 60612
Phone:	708.848.4980
E-Mail:	info@ecoachievers.com

Related Sections Impacted by this Amendment:
R402.4.1.2 Air Leakage Testing

Revise as Follow (in strike-thru / underline format):

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~~ 3 air changes per hour. 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*, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after completion of all penetrations of the *building thermal envelope*.

Exception: For low-rise multifamily buildings, dwelling units shall be tested and verified as having a leakage rate of not exceeding 0.25 cubic feet per minute (cfm) per square foot of enclosure area (all six sides of the dwelling unit) in Climate Zone 1 through 8. Testing shall be conducted with an unguarded blower door at a pressure of 0.2 inches w.g. (50 Pascal). If guarded blower door testing (a test with one or more adjacent units pressurized, which should eliminate any leakage between units) is being performed, this exception is not allowed and the standard testing requirements of Section 402.4.1.2 apply. Where required by the code official, testing shall be conducted by an approved third party. For buildings with more than 7 units, a sampling protocol is allowed by an approved third party. The sampling protocol requires the first seven units to be tested without any failures. Upon successful testing of those initial seven units, remaining units can be sampled at a rate of 1 in 7. If any sampled unit fails compliance with the maximum allowable air leakage rate, two additional units in the same sample set must be tested. If additional failures occur, all units in the sample set must be tested. In addition, all units in the next sample set must be tested for compliance before sampling of further units can be continued.

Reason:

The underlined text above is directly copied and pasted from Klocke et al (2014) findings in the US Department of Energy report entitled "Challenges of Achieving 2012 IECC Air Sealing Requirements in Multifamily Dwellings"

Eco Achievers has been performing blower door testing for over 10 years in Illinois and while the code thresholds work well for single family home builders, numerous multifamily builders and affordable housing owners have severely struggled meeting the blower door test requirements. This is because there is more

leakage across unit-to-unit and unit-to-corridor walls than there is outside. Furthermore, using a volume-based metric such as Air Changes per Hour (ACH) on a small volume apartment unfairly penalizes those small units. This has been a major issue with studio or 1 bedroom units, putting undue pressure on the builder to comply with the test thresholds.

Moving to a surface-area metric as proposed above, such as CFM50 per square foot of enclosure, levels the playing field. Furthermore, the 0.25 cfm50/ft2 of enclosure area roughly equates to 4.5–5.5 ACH50 for typical size apartment dwellings, which is similar to the airtightness rate currently specified by the 2015 Illinois Energy Conservation Code.

Finally this metric has already been accepted by the Illinois Department of Commerce and Economic Opportunity (DCEO) since 2015 for affordable housing projects receiving DCEOs low-income grant as an equivalent alternative metric for Air Leakage testing.

Cost Impact:
The proposed alternative testing metric will save money for multifamily builders and developers, who will be able to more easily meet Air Leakage testing requirements for the smaller higher-density residences they are building, yet still provides the energy performance.

The big cost savings from this change allows significant savings in air leakage testing fees. Currently the code does not specify a sampling protocol so every single residence is typically tested. Once a multifamily builder develops consistency and passes the test, this often becomes an undue cost burden requiring them to go through even though they know every unit will pass the testing once the first few units are tested and any deficiencies are corrected. A sampling protocol will save significant third-party testing fees (often for firms such as ours), and help prevent delays in construction and delivery of multifamily buildings. In a sampling approach roughly 15%-20% of the units will end up being tested, assuming no failures. Allowing for the sampling provision means a multifamily builder will often receive **80%-85 cost savings** on the air leakage testing fees.

Signature (for release of copyrights):

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ILLINOIS GREEN

A USGBC COMMUNITY

222 MERCHANDISE MART PLAZA
SUITE 1502
CHICAGO, IL 60654

Friday, March 30, 2018

To: Lisa Mattingly and the Illinois Energy Codes Advisory Council

From: Illinois Green Alliance (formerly USGBC-Illinois)

Re: Illinois Green Alliance's comments in support of the full adoption of the 2018 International Energy Conservation Code

Dear Ms. Mattingly and members of the Illinois Energy Codes Advisory Council:

Thank you for the opportunity to provide comments on the update to the 2018 International Energy Conservation Code (IECC) as the statewide energy code in Illinois. The **Illinois Green Alliance** is a membership driven, non-profit that works to promote green buildings and sustainable communities. We are the local affiliate of the U.S. Green Building Council (USGBC).

The clean energy sector currently supports more than 119,395 jobs in Illinois, of which 78% are in energy efficiency. Of those energy efficiency jobs, all are interdependent with the building industry, whether it be HVAC, insulation, or lighting. These are good, in-state jobs in a vital, growing sector of Illinois' economy. In fact, the clean energy sector grew at a rate of 4.8% from 2015 - 2016 – over six times faster than all other sectors in the state. With over 40% of energy being consumed by the building sector, building energy codes are the foundation upon which the majority of clean energy jobs are built.

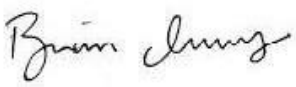
By updating the state residential and commercial energy code, Illinois has an opportunity to build on this foundation, reduce energy waste, improve the livability and resiliency of new buildings, and continue to spur local construction and manufacturing jobs. **Illinois Green Alliance strongly recommends the adoption of the 2018 International Energy Conservation Code without weakening amendments as the statewide minimum building energy code.** We support this adoption because:

1. Efficiency and building improvements stemming from the 2018 IECC will save money and reduce energy usage in both residential and commercial buildings
2. Studies have shown that the adoption of improved energy codes will result in healthier, more comfortable, and more resilient buildings.
3. Energy codes serve as a critical consumer protection, locking in energy and financial savings for decades to come
4. Adopting the 2018 IECC will provide more flexibility for residential builders in terms of compliance than the current code
5. Residential Builders in Illinois have already demonstrated the ability to meet key 2018 IECC energy code measures

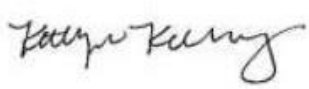
The adoption of the 2018 IECC is a cost-effective way for Illinois to gradually increase the level of building efficiency and remain a leader in the Midwest. We recommend the adoption of the unamended 2018 IECC for residential and commercial buildings as a way to reduce long-term energy use and costs for residents and taxpayers, create healthier and more comfortable indoor environments and increase the resiliency of the building stock so new residential dwellings and commercial buildings last for the next 75-100 years.

If you have any questions about this testimony, please contact Katie Kaluzny, Associate Director, Illinois Green Alliance at kkaluzny@illinoisgreenalliance.org or 312-245-8300.

Sincerely,



Brian Imus
Executive Director
Illinois Green Alliance



Katie Kaluzny
Associate Director
Illinois Green Alliance

Chris Dillion
Ex-Officio Board Chair
Illinois Green Alliance

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Friday, March 30, 2018

Lisa Mattingly
IL Capital Development Board
401 South Spring Street
3rd Floor Wm. G. Stratton Building
Springfield, IL 62706

Re: **MEEA's comments in support of the full adoption of the 2018 International Energy Conservation Code**

Dear Ms. Mattingly and members of the Illinois Energy Code Advisory Council,

Thank you for the opportunity to provide comments on the update to the 2018 International Energy Conservation Code (IECC) as the statewide energy code in Illinois. The Midwest Energy Efficiency Alliance (MEEA) is a member-based non-profit organization that promotes cost-effective energy efficiency policies in the Midwest. We have worked with previous administrations on building energy codes in Illinois.

The clean energy sector currently supports more than 119,395 jobs in Illinois, of which 78% are in energy efficiency. Of those energy efficiency jobs, all are interdependent with the building industry, whether it be HVAC, insulation, or lighting. These are good, in-state jobs in a vital, growing sector of Illinois' economy. In fact, the clean energy sector grew at a rate of 4.8% from 2015 - 2016 – over six times faster than all other sectors in the state. With over 40% of energy being consumed by the building sector, building energy codes are the foundation upon which the majority of clean energy jobs are built.[1]

By updating the state residential and commercial energy code, Illinois has an opportunity to build on this foundation, reduce energy waste, improve the livability and resiliency of new buildings, and continue to spur local construction and manufacturing jobs. MEEA strongly recommends the adoption of the 2018 International Energy Conservation Code without weakening amendments as the statewide minimum building energy code. We support this adoption because:

1. **Efficiency and building improvements stemming from the 2018 IECC will save money and reduce energy usage in both residential and commercial buildings**

   With the adoption of the 2018 IECC, all new buildings, and existing buildings undergoing major renovations or additions, will become more energy efficient, leading to reduced costs for homeowners, consumers and businesses. According to a recent analysis, **new homebuyers in Illinois could expect to reduce their annual energy use by 14% and energy costs by approximately $200 annually if the 2018 IECC is adopted without amendments**, when compared to the current code.[2] When factoring in increased costs, this update

[1] Clean Energy Trust, Clean Jobs Illinois. https://www.cleanjobsmidwest.com/state/illinois
[2] Based on MEEA analysis: Using REM/Design to analyze the DOE model home with a heated basement. Average energy and cost savings based on 2017 level of construction in CZ4 and CZ5.

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proves to be cost effective.[3] A homeowner with a 30-year mortgage will realize a positive cash flow after ten months, and a life-cycle cost savings of over $2,400.[4] Commercial building owners and operators will also realize energy and cost savings for buildings built to the updated code. In a recent analysis, the **US Department of Energy (DOE) found that updating to the 2018 IECC will reduce commercial building energy use by 6.7% and energy costs by 8.3%.**[5] These energy and cost savings will continue for the life of a building, which can extend 50 – 100 years or more.

Updated energy codes also strengthen the local economy by giving homeowners and businesses more disposable income. By updating to the 2018 IECC for commercial and residential buildings, MEEA estimates that Illinois residents would collectively save nearly $4 million and 275,000 MMBTUs in the first year, equivalent to the energy used annually by over 2,000 homes. However, first year savings only tell a fraction of the positive impact from an updated energy code, since energy and cost savings from efficiency are cumulative in nature. According to a recent US DOE study which analyzed cumulative savings **over the years 2010 to 2030, Illinoisans could save around 1.2 billion dollars from consistently updating their residential and commercial energy code.**[6] In order to achieve the full potential of these energy savings, it is important that Illinois updates to the full 2018 IECC this cycle. An investment in cost-effective building energy codes will put money into residents' pockets and improve the local economies for years to come.

2. **Studies have shown that the adoption of improved energy codes will result in healthier, more comfortable, and more resilient buildings.**

A building enclosure that is tightly sealed, combined with a proper ventilation system, will have fewer indoor air pollutants. By controlling the movement of air into and out of the home, pollutants entering the home can be minimized, and those that still enter can be quickly exhausted to the outside.[7] The requirement for buildings to have well sealed envelopes and duct systems, verified with diagnostic testing, will help ensure the realization of these air quality benefits.

Additionally, improvements to the building envelope improve occupant comfort and maintain temperatures, especially during events with severe weather. **A study conducted after Superstorm Sandy found that homes built to newer energy codes enabled residents to**

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[3] Incremental construction cost of $1058. Costs associated with improved ACH50 and high efficacy lighting were derived from NAHB Estimated Costs of the 2015 IRC Code Changes. Insulation material costs were based on retail prices at Home Depot.
[4] Based on DOE's life-cycle cost analysis. US DOE, Cost-Effectiveness Analysis of the Residential Provisions of the 2015 IECC for Illinois https://www.energycodes.gov/sites/default/files/documents/IllinoisResidentialCostEffectiveness_2015.pdf
[5] See U.S. Department of Energy Savings Analysis: ANSI/ASHRAE/IES Standard 90.1-2016, October 2017. Based on a national weighted average. https://www.energycodes.gov/sites/default/files/documents/02202018_Standard_90.1-2016_Determination_TSD.pdf
[6] See DOE, *Impacts of Model Building Energy Codes*. October 2016. (Table 7)
https://www.energycodes.gov/sites/default/files/documents/Impacts_Of_Model_Energy_Codes.pdf
[7] See three studies on health and indoor air quality -https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3281289/
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4129915/
http://www.hvi.org/publications/pdfs/moldpaper_final1june09.pdf.

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safely stay in their homes longer after a power outage compared to similar buildings constructed under an older code. The ability to shelter in place longer saves lives and provides critical flexibility for deploying first responder resources.

3. **Energy codes serve as a critical consumer protection, locking in energy and financial savings for decades to come**

   Low-income households operate on fixed incomes and tight budgets.[8] **This population already spends an average of 7.2 percent of their income on energy bills compared to the national average at 3.5 percent.[9] The adoption of the 2018 IECC would help ease the burden on low-income households.** Considering that most newly built homes still be occupied in 50 to 100 years, many homes built today will eventually be inhabited by low-income families. The 2018 IECC helps to ensure that all new homes are constructed with a quality building envelope, locking in key efficiency and health improvements for years to come. It is important to note that these building features are rarely updated, so it is critical to have them included as part of the original construction.

4. **Adopting the 2018 IECC will provide more flexibility for residential builders in terms of compliance**

   Included in the 2018 IECC is a key code update that provides more flexibility to the builders when complying with the code. The **2018 IECC modifies the Energy Rating Index (ERI) compliance path to include the use of renewable energy and sets a more easily achieved ERI number for all homes.** The required ERI number would increase by six to eight points, depending on climate zone, when compared to the ERI numbers in the 2015 IECC. This compliance method uses an energy model - typically a Home Energy Rating Score (HERS) - which accounts for all efficiency aspects in a home, allowing full credit for more efficient HVAC equipment, water heaters, appliances and renewable energy. It is anticipated, that given the increased flexibility, this compliance path will see significantly more use.

   Increased flexibility is incorporated into other provisions in the code as well. The 2018 IECC gives more flexibility for duct design, allowing sealed and insulated ductwork that is buried in the attic insulation to be considered to be in conditioned space.

5. **Residential Builders in Illinois have already demonstrated the ability to meet key 2018 IECC energy code measures**

   Given that HERS assessments are typically used for ERI compliance, one can use HERS data to better understand how builders might comply with the ERI compliance path. A recent statewide analysis of HERS rated homes shows that over 14% (4,200) of newly constructed single-family detached homes built in Illinois (2014-2016) received a HERS assessment. This robust dataset reveals that, **the average HERS score in the state is a 55 and over 89% of**

[8] Now over 25 million American's 60+ live at or below 250% of the federal poverty level. https://www.ncoa.org/news/resources-for-reporters/get-the-facts/economic-security-facts/.
[9] See ACEEE and EE for All. Lifting the High Energy Burden in America's Largest Cities http://energyefficiencyforall.org/sites/default/files/Lifting%20the%20High%20Energy%20Burden_0.pdf.

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these builders achieved a HERS score of 61 or better- a score that would meet the ERI compliance path requirements everywhere in Illinois.[10] Additionally, homes in this dataset consistently meet or exceed the model energy code requirement for air leakage. As shown in Figure 2, **87% of all HERS rated single-family homes meet or exceed an air leakage rate of 3 ACH50.** This dataset clearly shows that meeting this key change in the 2018 IECC is well within the abilities of Illinois builders.[11]

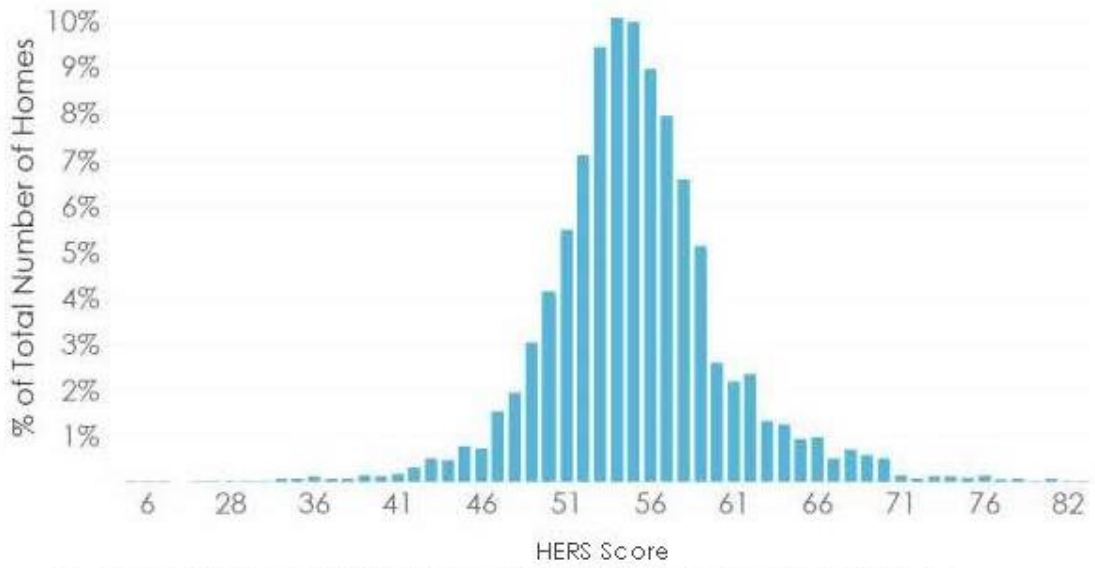

Figure 1: Distribution of HERS scores in single-family homes in Illinois: 2014-16

[10] *It's important to note that this HERS dataset was analyzed in REM/Rate V. 14.6 or earlier (the energy model primarily used for HERS ratings). The 2018 IECC requires that REM/Rate V. 15 or better be used for ERI compliance, which typically increases a HERS score by an average of 3 points, although not always. Thus, if these HERS ratings were assessed in the new REM/Rate version the average HERS score would likely be a 58, and approximately 75% would have met the 2018 IECC ERI number.*

[11] Based on an analysis of statewide HERS data in Illinois from 2014-2016. MEEA is happy to provide additional information from this analysis.

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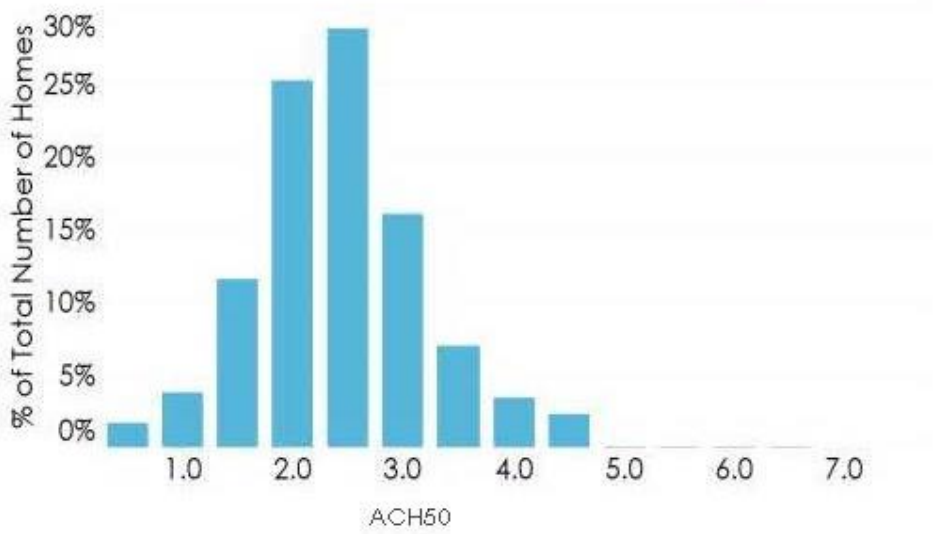

Figure 2: Distribution of ACH50 in HERS rated single-family homes in Illinois: 2014-16

The adoption of the 2018 IECC is a cost-effective way for Illinois to gradually increase the level of building efficiency and remain a building efficiency leader in the Midwest. We strongly recommend the adoption of the unamended 2018 IECC for residential and commercial buildings as a way to reduce energy use and costs for residents and taxpayers, create healthier and more comfortable indoor environments, and increase the resiliency of the building stock – ensuring that new residential dwellings and commercial buildings last for the next 75-100 years.

If you have any questions about this testimony, noted reports and references, or the general impact and analysis of building energy codes, please contact Ian Blanding, Senior Building Policy Associate for MEEA at iblanding@mwalliance.org or 312-784-7269.

Sincerely,

Stacey Paradis

Stacey Paradis
Executive Director

db|HMS

March 31, 2018

Ms. Lisa Mattingly
Capital Development Board
William G. Stratton Building
401 South Spring Street
Third Floor
Springfield, IL 62706

RE: Energy Codes Advisory Council
2018 Illinois Energy Conservation Code Amendments

Ms. Mattingly:

Over the coming weeks, the Energy Codes Advisory Council will review many requests to amend the 2018 IECC as it applies to the State of Illinois. As a design engineer at a firm that works across many sectors of the industry, we recommend that the Advisory Council exercise the utmost scrutiny when reviewing these amendment requests and consider allowing the 2018 IECC to pass without amendments. The industry already knows how to deliver buildings at thirty to fifty percent better than code; allowing parts of the market another three years to catch up will not protect the health and life safety of the people of Illinois.

Our recommendation rests on three key observations we have around the energy code:

- The code already has mechanisms that allow projects flexibility to choose some elements of the building design that do not meet the prescriptive code,
- The process for developing the code ensures that any strategy or technology necessary to meet the code already exists widely in the marketplace,
- Amending the code provides indirect support to parts of the industry that will naturally and quickly evolve when faced with meeting the full requirements.

On the first point, the performance path of the Commercial section of the code now has a more fleshed out companion in the Residential section. This provides a fully performance based alternative for all projects. Combined with the fact that some elements of the code requirements – e.g. lighting power density, water heater performance, and building air leakage – sit far below what the market can already achieve, these performance paths allow project teams to incorporate under-performing elements and offset them with better-performing elements. Providing a blanket amendment absolves the project developers and designers from identifying and taking advantage of these opportunities.

For the process point, as you and the Council know, the 2018 IECC finds its foundation in ASHRAE 90.1-2016. That standard underwent amendment and review back in 2015-2016. The technologies and strategies that underpin that 2015-2016 work have been in the marketplace for at least five years prior. With the 2018 Illinois Energy Conservation Code going into effect in 2019, the marketplace will have had ten years to adapt to the technology and strategies. Most, if not all, of the industry can meet the requirements – and in our experience well within the cost of

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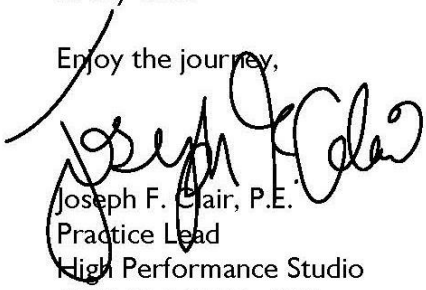
construction. The multifamily residential marketplace provides a great example of this. Our firm sees market-rate projects that regularly exceed energy code by ten to fifteen percent without any effort on the part of the design team, and then double that performance once high-performance design considerations come into play. This comes from the experience many developers and designers have in the affordable housing market which has much more stringent requirements. The marketplace has adapted and by and large has moved past the code minimum as a standard of practice.

This leads to the last point about the amendment process favoring firms that do not want to evolve. Recognizing that the adaptation process to a new code appears daunting at every three years, but incorporating the point above about the basis for the code, designers and builders today that do not think they can achieve the code minimum level of practice have had to make an active choice to do so. When 2006 IECC and 2009 IECC came out, they presented major shifts to the industry, and lowered the expected energy use in buildings drastically. Ten years later, these much more moderate shifts in the expectations reflect common sense, commonplace thinking. All parts of the industry, from single-family homes to large university/municipal/healthcare projects have a vast array of designers, developers, and builders who can deliver better-than-code buildings at or below the trending cost of construction. Allowing amendments to the code does not provide relief to an industry that might fail, but rather it allows some participants in the market to survive that would otherwise have to raise themselves to the rest of the market. Given the new performance-based opportunities in the Residential section, this sort of accommodation is no longer necessary.

Thank you for taking the time to consider our recommendation, and especially for your efforts and those of the CDB to further the construction industry in Illinois. As a part of that industry, and seeing how quickly the market has adapted to building better-than-code buildings at the cost of construction, we hope you will consider allowing 2018 IECC to stand as is as the new 2018 Illinois Energy Conservation Code. If you have any questions, please do not hesitate to contact me at any time.

Enjoy the journey,



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