
presented by:
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Architectural Service Director
The 7th Edition Base Code

Note: The code also references other MA codes (plumbing, electrical, etc.) and I-codes* which cover mechanical and energy requirements.

*Can be purchased at www.iccsafe.org
The 8th Edition uses I-codes

Now Effective for Massachusetts - 2009 International Codes®
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2009 International Building Code®
2009 International Mechanical Code®
2009 International Existing Building Code®
2009 International Energy Conservation Code®

Note: The code also references other MA codes (plumbing, electrical, etc.)

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ICC - BUILT ON A SOLID FOUNDATION

• Two centuries of collective experience
• A history of support for public safety
• Widespread recognition and reliance throughout the U.S. and the world.
• Merger in 1994

BOCA = Building Officials and Code Administrators International
ICBO = International Conference of Building Officials
SBCCI = Southern Building Code Congress International
• International Building Code (IBC)
• International Residential Code (IRC)
• International Fire Code (IFC)
• International Energy Conservation Code (IECC)
• International Plumbing Code (IPC)
• International Private Sewage Disposal Code (IPSDC)
• International Mechanical Code (IMC)
• International Fuel Gas Code (IFGC)
• International Wildland-Urban Interface Code (IWUIC)
• International Existing Building Code (IEBC)
• International Property Maintenance Code (IPMC)
• International Zoning Code (IZC)
• International Green Construction Code (IGCC)
What is a Model Code?

• A building code that is developed and maintained by an organization independent of the jurisdiction responsible for enacting the building code.
  – No force of law – must be adopted by jurisdiction.
  – Avoids “Reinventing the Wheel” in each state.
  – Involves nationwide experts to reflect diverse views and state of the art.
  – Utilizes consensus development process
    • Open
    • Transparent
    • Balance of Interest
    • Due Process
• Virtually all governmental entities that adopt a model code amend the document.
• State or local code committees for the jurisdiction review the model code with respect to:
  – Specific local conditions and needs
  – Local building practices
  – Local materials available
  – Union rules and requirements
  – Political considerations
International Energy Conservation Code® Fundamentals
History of the IECC

• Original code known as the Model Energy Code (MEC) developed by CABO, BOCA, ICBO, NCSBCS, and SBCCI under a DOE contract in 1983.

• Title changed to the International Energy Conservation Code (IECC) in 1998 with the formation of ICC.

• ICC’s International Energy Conservation Code (IECC) is now the most widely adopted energy code in the world.
Encourages energy conservation through efficiency in envelope design, mechanical systems, lighting systems and the use of new materials and techniques.
The IECC® applies to:

- Residential Buildings
  - One- and Two-family dwellings, Townhomes (not-IRC buildings such As Energy Star Rated Homes)
  - Multifamily dwellings three-stories or less in height

- Commercial Buildings
  - Multifamily dwellings four stories or greater in height

- New Buildings

- Additions, Alterations, Renovations, & Repairs
Residential Compliance Process

Must the project comply with the IECC?

Insulation, Air Leakage, Lighting & Building Systems

Building Thermal Envelope and Electrical

Performance Path

Simulated Performance Alternative

Prescriptive Path

R-value Computation

UA Alternative

Total UA Alternative

Document Compliance with IECC

Plan Review

Field Inspection
Regionalization in 2009
Regionalization in 2013 – Stretch Code

Stretch Code Adoption, by Community

One hundred thirty-four (134) municipalities have adopted the new Board of Building Regulations and Standards (BBRS) Stretch Code, as of October 30, 2013.
**IECC’s relationship with the IRC**

- Intended to work hand-in-hand
- Tables are NOT identical
- Simulated Performance option is not in IRC
- Vapor Retarders are in Chapter 6 – NOT IECC

<table>
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</table>

- The International Residential Code (IRC) is a comprehensive, stand-alone residential code that creates minimum regulations for one- and two-family dwellings of three stories or less. It brings together all building, plumbing, mechanical, fuel gas, energy and electrical provisions for one- and two-family residences. The IRC also provides a prescriptive approach (i.e., a set of measures) and a performance approach (i.e., energy modeling) for determining compliance.

- The IECC is similar to the energy related components of the IRC, and is referenced within the IRC, though the two are not always identical. *Each state has its own energy code requirements.*
Preliminary estimates from U.S. DOE suggest the 2009 IECC will be at least 18 percent and possibly even 22 percent more energy efficient than the 2006 IECC.

*David Rodgers, Deputy Assistant Secretary, U.S. DOE-EERE, statements before Committee on Energy and Commerce, Subcommittee on Energy and Air Quality, U.S. House of Representatives, July 17, 2008.*
Residential Buildings

IECC® State-wide Adoptions

- 2009 IECC or equivalent
- 2006 IECC or equivalent
- 2003 IECC or equivalent
- 2000/01 IECC or equivalent
- 1998 IECC or less
- No Statewide Energy Code

JANUARY 2009
International Energy Conservation Code® - Federal Citations

• National private and Federal housing initiatives
• Energy Independence & Security Act of 2007 (EISA)
• Energy Conservation & Production Act, as amended
  – National benchmark for single family homes and townhomes
  – National benchmark for low-rise condominiums and apartments
• Manufactured Housing (HUD 24 CFR 3280)
• Energy Efficient Mortgage Programs (FHA, VA, Fannie & Freddie)
American Recovery and Reinvestment Act of 2009

• Contains language requiring a plan to adopt the 2009 IECC or better-residential/ 2007 ASHRAE 90.1 or better-commercial.
  – Condition for qualifying for $3.1 billion in State Energy Program funds
  – Stimulus also funds EISA Block Grants, which has specific language authorizing grants to develop, implement and adopt and enforce, building codes
ARRA: Reaching full Compliance

- Stimulus requires both a plan for active training an enforcement, and annual measurement of percent compliance to reach 90% by 2017.
  - Much of the technology, construction methods, test methods, and some of the products are new, and both builders and contractors and code officials will need training to achieve full compliance.
  - The stimulus requires a plan, and provides funds.
What’s New in the Code – 7th to 8th Edition of the Massachusetts Code

Note: The code also references other MA codes (plumbing, electrical, etc.) and I-codes* which cover mechanical and energy requirements.

*Can be purchased at www.iccsafe.org

MA Amendments
(Sold at the bookstore.)
I.e., Stretch Code

Note: The code also references other MA codes (plumbing, electrical, etc.) and I-codes* which cover mechanical, energy, and existing building requirements.

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The 8th Edition uses I-codes

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2009 International Energy Conservation Code®

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Example: How do I find energy requirements for building envelope sealing?

- Go to chapter 13 of IBC: IBC says to use IECC.
- Found in section 502.4.3 of IECC.
- Check MA amendments for chapter 13: it also says use IECC **but with MA amendments**.
- Note: MA amendments in 13 are listed according to IECC section numbers and yes, section 502.4.3 has been amended!
THE JURISDICTION OF THE STATE BUILDING CODE (780 CMR)

780 CMR essentially applies to all buildings and structures in the Commonwealth, except for the State House, Federal Buildings, bridges and appurtenant structures of numbered highways or roads maintained by highway departments or structures under the control of the USCG in navigable waters of the USA.

SEE MGL C.143, §§ 93 - 100
THE ROLE OF THE STATE BUILDING INSPECTOR

For buildings that permitted to state-owned or state authority buildings and structures, and any private buildings in which the State or State Authority holds partial ownership, a State Building Inspector must be involved.

SEE MGL C.143 § 3A
THE 8TH EDITION OF 780 CMR “Base” (Commercial) Volume

- Based on the 2009 International Model Building Codes w/Massachusetts Amendment

(1) The 8th Edition Base Volume addresses all Buildings Other than detached “1 & 2” Family Buildings and Small Townhouses (3 stories or less)

(2) 3 or more units are regulated under IBC (a single Condo unit is not one-family dwelling – not required to meet the Stretch Code)
• The 8th Basic Code Volume came into full effect on February 6, 2011.

• {AS AN ASIDE: The 8th Edition “1 & 2” Family Volume came into full effect on August 6, 2011.}
ADDITIONAL “I”-CODES UTILIZED

The 8th Edition of 780 CMR, in addition to using the International Building Code (IBC-2009), also utilizes:
(a) The International Mechanical Code (IMC-2009)
(b) The International Fire Code (IFC-2009)
(c) The International Energy Conservation Code (IECC-2009)
(d) The International Residential Code (IRC-2009)
The 8th Edition of 780 CMR, in addition to using the International Building Code (IBC-2009), also utilizes:

(e) The International Existing Building Code (IEBC-2009)
• Chapter 1 - ADMINISTRATION.

• Chapter 2 - DEFINITIONS.


• Chapter 4 - SPECIAL DETAILED REQUIREMENTS (high-rise, Atriums, Underground Buildings, I-2 & I-3 USE, Stages & Platforms, Motor Vehicle occupancies, etc.).

• Chapter 5 – HEIGHTS & AREAS.

• Chapter 6 – TYPES OF CONSTRUCTION
THE BUILDING CODE BRIEF OVERVIEW, contd.

• Chapter 7 – FIRE & SMOKE PROTECTION FEATURES (fire resistance ratings, fire walls, shaft enclosures, etc.).

• Chapter 8 – INTERIOR FINISHES (wall & ceiling, floor, etc.).

• Chapter 9 – FIRE PROTECTION SYSTEMS.

• Chapter 10 – MEANS OF EGRESS.

• Chapter 11 – ACCESSIBILITY (defaults to 521 CMR).

• Chapter 12 – INTERIOR ENVIRONMENT (ventilation, lighting, sound transmission, etc.).
THE BUILDING CODE BRIEF OVERVIEW, contd.

• **Chapter 13** – ENERGY EFFICIENCY (defaults to a MA-amended International Energy Conservation Code – IECC).

• **Chapter 14** – Exterior Walls

• **Chapter 15** – Roof Assemblies & Rooftop Structures (roof coverings, fire classifications, reroofing, rooftop structures, etc.).

• **Chapter 16** – STRUCTURAL DESIGN.

• **Chapter 17** – STRUCTURAL TESTS & SPECIAL INSPECTIONS.

• **Chapter 18** – SOILS & FOUNDATIONS.
THE BUILDING CODE BRIEF OVERVIEW, contd.

• Chapter 19 – CONCRETE
• Chapter 20 – ALUMINUM
• Chapter 21 – MASONRY
• Chapter 22 – STEEL
• Chapter 23 – WOOD
THE BUILDING CODE BRIEF OVERVIEW, contd.

• Chapter 24 – GLASS & GLAZING (includes safety glazing requirements and fenestration design considerations).

• Chapter 26 – PLASTIC (allowed use of plastics, flame spread and smoke developed rating requirements, etc.).

• Chapter 27 – ELECTRICAL (defaults to 527 CMR 12, identifies where emergency & standby power are required).

• Chapter 30 – ELEVATORS & CONVEYING SYSTEMS (defaults to 524 CMR w/780 CMR fire rating and energy code requirements).
• Chapter 31 – SPECIAL CONSTRUCTION (tent & membrane structures, pedestrian walkways & tunnels, etc.).

• Chapter 32 – Encroachments into the public right-of-way (construction safeguards, protection of pedestrians, protection of adjoining property, demolition, etc.).

• Chapter 34 – EXISTING STRUCTURES – defaults to a MA-amended International Existing Building Code - IEBC (additions, alterations, renovations, repairs, change of occupancy, etc.).

• Also see MA-amended Appendices.
• Web-based variant of the 8th Edition of 780 CMR (MA-front-end amendments only) are found on DPS Web Site

But

• One needs all applicable ICC Codes to Utilize the 8th Edition of 780 CMR

www.mass.gov/dps
DPS Website: www.mass.gov/dps

Massachusetts Department of Public Safety

DPS Incident Hotline
Please be advised that the Department of Public Safety (DPS) has instituted a new protocol for the reporting of incidents that require the immediate attention of the DPS. If there is an Emergency involving a DPS regulated activity please contact the Massachusetts Emergency Management Agency at (508) 820-1444 to report DPS related incident.
This number should be used for all DPS related events, including but not limited to the following: Incident involving:
1. Building collapse/failure
2. Elevators/escalators
3. Boiler or air tank failure/explosion
4. Amusement or tramway incidents
5. Horse carriage incidents
6. Incidents involving hoisting and excavating equipment.
For all Non-Emergency calls please dial 617-727-3200

DPS License Lookup
Building Code 780 CMR

CAUTION: To properly use this code information the reader must apply all applicable amendments to the “cover-to-cover” volume of each edition. For example, amendment 53.12.2 “Guard Opening Limitations”, which became effective on 4-16-08, amends Section 5312.2 of the “cover-to-cover” 7th Edition One and Two Family Dwelling Volume which has an earlier effective date of January 2008.

The information below is provided for convenience and is not official. Please contact the State Bookstore (617-727-2834) for official code publications.

8th Edition Base Volume - (Concurrent with 7th until February 6, 2011)
- 8th Edition Base Volume
- 8th Edition Supplemental Information (Pending)

7th Edition Base Volume - (Expires February 6, 2011)
- 7th Edition Basic - (September 2008)
- Amendments to September 2008 Base Volume
  - 1.00, Remove HIC - (2-5-10) PDF (3.71mb)
  - 1.06, 1.08, R-2 Inspections, delete solar CSL Exemption PDF (2.61mb)
  - 1.10.2 Temporary Emergency Use NOC - (10-16-09) Emergency PDF (1.78mb)
A Brief Tour of the DPS Web Site is now presented as one can find:

(1) All MA amendments of the 8\textsuperscript{th} Edition Code.
(2) Links to the ICC and their Codes.
(3) State Building Inspector Contact Information.
(4) State Building Permit Forms.
(5) Free PowerPoint Education Presentations.
(6) Schedules of Meetings and Hearings.
State: Massachusetts
Incentive Type: Building Energy Code
Eligible Efficiency Technologies: Comprehensive Measures/Whole Building
Applicable Sectors: Commercial, Residential

Residential Code:

Commercial Code:
Eighth Edition, Massachusetts Base Building Code (780 CMR) -- Chapter 13 stipulates that new buildings comply with 2009 IECC with MA amendments

Code Change Cycle:
The state Board of Building Regulations and Standards (BBRS) is required to revise the building code to the latest version of the IECC every three years. Public hearings are held each May and November to consider proposed modifications to the code. Most recent update effective February
Legislation enacted in July 2008 (S.B. 2768) authorized the Massachusetts State Board of Building Regulations and Standards to adopt the most recent International Energy Conservation Code (IECC) as part of the state building code, together with any more stringent energy-efficiency provisions that the board, in consultation with the Massachusetts Department of Energy Resources (DOER). The energy provisions of the state building code must be updated within one year of any revision to the IECC. The 7th Edition of the Massachusetts Building Code became effective on October 6, 2008. The residential code update was fully effective immediately. For commercial buildings, there was a 6-month interim period until April 6, 2009 in which either the 6th or the 7th edition of the commercial code could be used.
In May 2009, the Massachusetts Board of Building Regulations and Standards (BBRS) approved Appendix 120AA as an optional amendment to the 7th edition Massachusetts Building Code 780 CMR. This optional "stretch code" was developed in response to the call for improved local building energy efficiency in the state. Towns and cities may adopt Appendix 120AA as an alternative to the base energy efficiency requirements of 780 CMR and the forthcoming 8th edition, based on the 2009 IECC. The appendix, which includes both a residential and commercial stretch code, is designed to be about 30% more stringent than the 2006 IECC/ASHRAE 90.1-2004 (20% more efficient than IECC 2009). Switching to the "stretch code" is one of the criteria required for local communities to qualify for the DOER's Green Communities Grant Program. There are 104 communities, including Boston, that have adopted the stretch code in Massachusetts (as of January 2012).
Chapter 13: Energy Efficiency

Overview

• What is the Same?
  • Technical and administrative MA Amendments.
  • ASHRAE 90.1-2007 remains the default design option.

• What is different?
  • Format and Section numbering
  • No new major requirements; The devil is in the details...
Chapter 13: Energy Efficiency

Changes and noted issues:

- **MA Amendments**: No technical/administrative differences between 7th & 8th Edition.
- **Technical differences**: are between IECC-2006 w/2007 Supplement and IECC-2009.
- **Format/Section numbering changes**: exist between IECC-2009 and earlier variant.
- **ASHRAE 90.1-2007** (C1); remains the default design option.
- **Administrative criteria** (C1); C1 of the 8th overrides the admin. criteria of C1 of IECC-2009.
- **Vapor retarder** (C4); requirements of IECC-2007 moved to IRC-2009, C6 & C11.
- **Prescriptive changes** (T402.1.1 and T402.1.3); several numerical changes to R or U Factors.
- **Optional air leak testing** (402.4.1); allows, as an option, physical air leakage testing (testing is not mandatory as visual inspections allowed).
- **Computer modeling** (405); “SIMULATED PERFORMANCE ALTERNATIVES” has an expanded set of guidance/requirements on how to do such computer modeling.
- **Prescriptive changes** (T502.1.2 & T502.2(1)); reflect more stringent R and U values and generally require different R and U values for “Commercial” buildings v. “Residential” buildings.
- **Vapor retarder** (C5); requirements of IECC-2006/2007 moved to C14 of the IBC-2009.
Chapter 13: Energy Efficiency

- **HVAC equipment performance requirements** (503.2.3); the EXCEPTION, now in more detail, addresses water-cooled centrifugal water chilling packages not designed for operation at ARHI Standard conditions.
- **Chiller efficiency** (T503.2.3(7)); updated efficiency requirements.
- **Snow melt systems** (503.2.4.5); requires auto shutoff controls for heated pavements.
- **Pipe insulation** (T503.2.8); has slightly more conservative pipe insulation thicknesses than earlier table versions.
- **Required Rigid Insulation** under Slabs for certain building types – schools, educational
- **Continuous Air Barriers** to control leakage into the interior space.
- **Air systems** (503.2.10): inclusive, addresses air system design and control.
- **Hydronic pump system** (503.4.3.3); “Hydronic (water loop) heat pump systems”, inclusive, updated.
- **Lighting in dwelling units** (505.1) ; EXCEPTION, exempts lighting w/in dwelling units where 50% or more of permanently installed interior light fixtures use high-efficacy lamps.
- **Total connected interior lighting power** (505.5.1); EXCEPTIONS have been expanded.
- **Exterior light zones** (T505.6.2(1)); Table has been added.
- **Total building performance** (506 inclusive); has an expanded set of guidance/requirements on how to do such computer modeling.
Residential Codes
The International Residential Code® (IRC®) was created to serve as a complete, comprehensive code regulating the construction of single-family houses, two-family houses (duplexes) and buildings consisting of three or more townhouse units. All buildings within the scope of the IRC are limited to three stories above grade plane. For example, a four-story single-family house would fall within the scope of the International Building Code® (IBC®), not the IRC.

The IRC contains coverage for all components of a house or townhouse, including structural components, fireplaces and chimneys, thermal insulation, mechanical systems, fuel gas systems, plumbing systems and electrical systems. The IRC is a prescriptive-oriented (specification) code with some examples of performance code language. It has been said that the IRC is the complete cookbook for residential construction. Section R301.1, for example, is written in performance language, but states that the prescriptive requirements of the code will achieve such performance.
Where does the Stretch Code fit in on July 1, 2014?

Background/Discussion:
The Board of Building Regulations and Standard (BBRS) has adopted the *International Energy Conservation Code 2012* as the base energy code effective July 1, 2014. Questions concerning this action and how for example it may impact the Stretch Code have arisen. The purpose of this official interpretation is to provide guidance on what code is effective.

**QUESTION:** Which version of the *International Energy Conservation Code* does the Stretch Code utilize?

**ANSWER:** The IECC 2009. Note that the Stretch Code remains unchanged on July 1, 2014 and it applies to certain buildings, portions thereof and additions. (Refer to 115.AA, Section 101.2, “Scope”.)

**QUESTION:** Which version of the *International Energy Conservation Code* applies for buildings, portions thereof, and additions not expressly regulated by Stretch Code?

**ANSWER:** The IECC 2012 with Massachusetts amendments. The IECC 2012 applies to all buildings not regulated by the Stretch Code throughout the Commonwealth, in Stretch Code communities and non-Stretch Code communities alike.
What building type apply to Stretch Code?

- Residential Buildings – Single Family Homes up and including buildings 3 stories or less of any size.
  - It applies to new construction, additions and major renovations. Historic Buildings are exempt from code and stretch code.

- New Commercial Buildings over 5000 SF in size, including multi-family residential buildings over 3 stories. Some buildings exempt. - Supermarkets, labs below 40,000 sf
What is Residential Stretch Code based on?

- The Pre-existing “Energy Star for Homes” developed by the federal EPA and DOE and customized for Massachusetts.
- This Energy Star Program is built upon the Home Energy Rating System (HERS) which is administered by Residential Energy Services Network (RESNET).
- Residential buildings meeting the stretch code through a HERS rating and EPA thermal bypass or thermal enclosure checklist require independent certification by a HERS rater. The rater will produce a report detailing the energy systems in the building and will provide a HERS index score, together with proof of whether the home qualifies for any federal tax credits. Submission of the HERS report, together with a completed Energy Star Thermal checklist, are the steps required to demonstrate compliance with the energy portions of the code, and must be submitted to the local building inspector prior to receiving a certificate of occupancy.
How do I meet the Residential Stretch Code for New Homes?

- For new residential homes including multi-family homes of 3 stories or less, builders essentially follow the 2006 Energy Star for Homes program requirements in Massachusetts, and must show that each unit meets or is below a maximum HERS index score.

- New construction – HERS rater required
  - Less than 3000 sq ft – HERS rating of 70 or less
  - 3000sq ft and more – HERS rating of 65 or less
  - Shall comply with Thermal Bypass Inspection Checklist.
What is a HERS Rating?

- HERS stands for ‘Home Energy Rating System,’ and is a national standard that uses information on the design of the energy systems in a home to calculate, via computer modeling, the average energy needs of that home and give it a rating score.

- On the HERS 2006 index scale smaller numbers are better, with 0 representing a net zero energy home, and 100 representing a home built to meet the national model energy code in 2006 (the IECC 2004 with 2005 amendments). A HERS rating of 65 means that the home uses about 35% less energy than the same size home built to the 2004/2005 IECC code requirements.
Do I have to get a HERS rating?

- New homes built under the stretch code must get a HERS rating. Renovations and additions to homes have the option of the HERS rating or a ‘prescriptive’ approach, whereby specific efficiency measures are required, but no computer modeling is done.

- The HERS performance-based approach provides an excellent way to ensure that homes are not only well designed but also well built. As part of the HERS rating the home will be tested for air leakage, and under both the base and the stretch code homes with heating and cooling ducts may also have those tested for leakage.
How do I meet the residential stretch code when making renovations to existing homes?

- Existing homes being renovated or expanded have two choices when it comes to stretch code compliance. The performance option is based on a HERS rating, while the prescriptive option uses the base IECC 2009 energy code, but in addition requires quality assurance with either the Energy Star Thermal Bypass or the new Thermal Enclosure checklist and the use of Energy Star windows doors and skylights where replacements are made. If the prescriptive option is chosen, then you only need to meet code for the systems that are being replaced. This means that adding a new efficient boiler does not require changing the windows, and adding wall and attic insulation does not require modifying the basement – although it may often make sense to combine measures where that is cost-effective.
Stretch Code Requirements Residential (currently)

- **New construction – HERS rater required**
  - Less than 3000 sq ft – HERS rating of 70 or less
  - 3000 sq ft and more – HERS rating of 65 or less
  - Shall comply with Thermal Bypass Inspection Checklist.

Additions – currently
- Shall comply with Thermal Bypass Checklist
- Window requirement U-factor to meet energy star requirements.
- Insulation shall conform to IECC 2009 chapter 4.
- Ducts 4cfm/100sq ft
- or may opt to go with HERS rating requirements for new construction

Renovations – Insulate IECC 2009 chapter 4 Fill cavities fully or opt for HERS Rating
- < 2000sq ft 85 HERS / 2000sq ft or more 80 HERS plus thermal compliance checklist
Residential Codes

• ENERGY STAR Qualified Homes
• Thermal Bypass Inspection Checklist
• The Thermal Bypass Inspection Checklist must be completed for homes to earn the ENERGY STAR label. The Checklist requires visual inspection of framing areas where air barriers are commonly missed and inspection of insulation to ensure proper alignment with air barriers, thus serving as an extra check that the air and thermal barriers are continuous and complete. State, local, and regional codes, as well as regional ENERGY STAR program requirements, supersede the items specified in this Checklist.
• Guidance on Completing the Thermal Bypass Inspection Checklist:
  1. Accredited HERS Providers and certified home energy raters shall use their experience and discretion in verifying that each Inspection Checklist item is installed per the inspection guidelines (e.g., identifying minor defects that the Provider or rater deems acceptable versus identifying major defects that undermine the intent of the Checklist item).
  2. Alternative methods of meeting the Checklist requirements may be used in completing the Checklist, if the Provider deems them to be equivalent, or more stringent, than the Inspection Checklist guidelines.
  3. In the event an item on the Checklist cannot be verified by the rater, the home cannot be qualified as ENERGY STAR, unless the builder assumes responsibility for verifying that the item has met the requirements of the Checklist. This option is available at the discretion of the Provider or rater but may not be used to verify more than six (6) items on the Inspection Checklist. This responsibility will be formally acknowledged by the builder signing-off on the Checklist for the item(s) that they verified. The column titled “N/A” should be used when the checklist item is not present in the home or when local code requirements take precedent.
• 4. The Checklist may be completed for a batch of homes using a RESNET-approved sampling protocol when qualifying homes as ENERGY STAR. For example, if the approved sampling protocol requires rating one in seven homes, then the Checklist will be completed for the one home which was rated.
• 5. In the event that a Provider or rater finds an item that is inconsistent with the Checklist Inspection guidelines, the home cannot be qualified as ENERGY STAR until the item is corrected in a manner that meets the ENERGY STAR requirements. If correction of the item is not possible, the home cannot earn the ENERGY STAR label.
• 6. The Provider or rater is required to keep a hard copy record of the completed and signed Checklist. The signature of a builder employee is also required if the builder verified compliance with any item on the Checklist.
• 7. For purposes of this Checklist, an air barrier is defined as any solid material that blocks air flow between a conditioned space and an unconditioned space, including necessary sealing to block excessive air flow at edges and seams. Additional information on proper air sealing of thermal bypasses can be found on the Building America Web site (www.eere.energy.gov/buildings/building_america) and in the EEBA Builder’s Guides (www.eeba.org). These references include guidance on identifying and sealing air barriers, as well as details on many of the items included in the Checklist.
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<tr>
<td>7 &amp; 8</td>
<td>49 49 49 49</td>
<td>21 21 21 20+5 or 13+10</td>
<td>19 19 19/21 19 / 21</td>
</tr>
</tbody>
</table>

1 = Where two numbers are listed the first is the cavity insulation and the second is continuous insulation (insulating sheathing).
2 = The second R-value applies when more than half the insulation is on the interior of the mass wall.
### IECC Prescriptive R-values Comparison (based on Table 402.1.1)

<table>
<thead>
<tr>
<th></th>
<th>Bsmt Wall R-value</th>
<th>Slab R-value &amp; Depth</th>
<th>Crawl Wall R-value &amp; Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Continuous / Cavity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'04</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>'06</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>'09</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>'12</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>'15</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>5/13</td>
<td>5/13</td>
<td>5/13</td>
</tr>
<tr>
<td>10/13</td>
<td>10/13</td>
<td>10/13</td>
<td>10/13</td>
</tr>
<tr>
<td>10/13</td>
<td>10/13</td>
<td>10/13</td>
<td>10/13</td>
</tr>
<tr>
<td>10/13</td>
<td>10/13</td>
<td>10/13</td>
<td>10/13</td>
</tr>
<tr>
<td>10/13</td>
<td>10/13</td>
<td>10/13</td>
<td>10/13</td>
</tr>
<tr>
<td>10/13</td>
<td>10/13</td>
<td>10/13</td>
<td>10/13</td>
</tr>
<tr>
<td></td>
<td>10, 2 ft</td>
<td>10, 2 ft</td>
<td>10, 2 ft</td>
</tr>
<tr>
<td></td>
<td>15/19</td>
<td>15/19</td>
<td>15/19</td>
</tr>
<tr>
<td></td>
<td>10, 4 ft</td>
<td>10, 4 ft</td>
<td>10, 4 ft</td>
</tr>
<tr>
<td></td>
<td>10, 4 ft</td>
<td>10, 4 ft</td>
<td>10, 4 ft</td>
</tr>
<tr>
<td></td>
<td>10, 4 ft</td>
<td>10, 4 ft</td>
<td>10, 4 ft</td>
</tr>
<tr>
<td></td>
<td>10, 4 ft</td>
<td>10, 4 ft</td>
<td>10, 4 ft</td>
</tr>
</tbody>
</table>
| 3 = In cases of two values (X/Y), the X value is continuous insul. on the ext. or int. of the wall, the Y value is cavity insulation at the interior of the wall
IECC Equivalent U-factors\textsuperscript{a} Comparison (based on Table 402.1.3)

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>Ceiling U-factor</th>
<th>Frame Wall U-factor</th>
<th>Mass Wall U-factor\textsuperscript{b}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>'04  '06  '09  '12  '15</td>
<td>'04  '06  '09  '12  '15</td>
<td>'04  '06  '09  '12  '15</td>
</tr>
<tr>
<td>1</td>
<td>0.035  0.035  0.035  0.035</td>
<td>0.082  0.082  0.082  0.084</td>
<td>0.197  0.197  0.197  0.197</td>
</tr>
<tr>
<td>2</td>
<td>0.035  0.035  0.03  0.03</td>
<td>0.082  0.082  0.082  0.084</td>
<td>0.165  0.165  0.165  0.165</td>
</tr>
<tr>
<td>3</td>
<td>0.035  0.035  0.03  0.03</td>
<td>0.082  0.082  0.057  0.06</td>
<td>0.141  0.141  0.098  0.098</td>
</tr>
<tr>
<td>4 exc. Marine</td>
<td>0.03  0.03  0.026  0.026</td>
<td>0.082  0.082  0.057  0.06</td>
<td>0.141  0.141  0.098  0.098</td>
</tr>
<tr>
<td>5 &amp; 4 Marine</td>
<td>0.03  0.03  0.026  0.026</td>
<td>0.06  0.057  0.057  0.06</td>
<td>0.082  0.082  0.082  0.082</td>
</tr>
<tr>
<td>6</td>
<td>0.026  0.026  0.026  0.026</td>
<td>0.06  0.057  0.048  0.045</td>
<td>0.060  0.060  0.06  0.06</td>
</tr>
<tr>
<td>7 &amp; 8</td>
<td>0.026  0.026  0.026  0.026</td>
<td>0.057  0.057  0.048  0.045</td>
<td>0.057  0.057  0.057  0.057</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.

\textsuperscript{b} When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except Marine, and the same as the frame wall U-factor in Marine Zone 4 and Zones 5 through 8.
### IECC Equivalent U-factors Comparison (based on Table 402.1.3)

<table>
<thead>
<tr>
<th>Floor U-factor</th>
<th>Bsmt Wall U-factor&lt;sup&gt;c&lt;/sup&gt;</th>
<th>Crawl Spcae Wall U-factor&lt;sup&gt;d&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>'04</td>
<td>'06</td>
<td>'09</td>
</tr>
<tr>
<td>0.064</td>
<td>0.064</td>
<td>0.064</td>
</tr>
<tr>
<td>0.064</td>
<td>0.064</td>
<td>0.064</td>
</tr>
<tr>
<td>0.047</td>
<td>0.047</td>
<td>0.047</td>
</tr>
<tr>
<td>0.047</td>
<td>0.047</td>
<td>0.047</td>
</tr>
<tr>
<td>0.033</td>
<td>0.033</td>
<td>0.033</td>
</tr>
<tr>
<td>0.033</td>
<td>0.033</td>
<td>0.033</td>
</tr>
<tr>
<td>0.033</td>
<td>0.028</td>
<td>0.028</td>
</tr>
</tbody>
</table>

- **c.** Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure 301.1 and Table 301.2.
- **d.** Foundation U-factor requirements shown in Table 402.1.3 include wall construction and interior air films but exclude soil conductivity and exterior air films. U-factors for determining code compliance in accordance with Section 402.1.4 (total UA alternative) of Section 405 (simulated Performance Alternative) shall be modified to include soil conductivity and exterior air films.
IECC Air Leakage Criteria Comparison

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>Whole-house Air Leakage Control Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>'04¹</td>
</tr>
<tr>
<td>1</td>
<td>NA</td>
</tr>
<tr>
<td>2</td>
<td>NA</td>
</tr>
<tr>
<td>3</td>
<td>NA</td>
</tr>
<tr>
<td>4 exc. Marine</td>
<td>NA</td>
</tr>
<tr>
<td>5 &amp; 4 Marine</td>
<td>NA</td>
</tr>
<tr>
<td>6</td>
<td>NA</td>
</tr>
<tr>
<td>7 &amp; 8</td>
<td>NA</td>
</tr>
</tbody>
</table>

¹ = in prescriptive approach no quantified criteria; in performance approach, Standard Ref. Design for air exchange rate is Specific Leakage Area = 0.00048.
² = in prescriptive approach no quantified criteria; in performance approach Standard Ref. Design for air exchange rate is Specific Leakage Area = 0.00036.
³ = in prescriptive approach, option 1 is testing bldg. thermal envelope for air changes per hour at 50 Pascals pressure difference, option 2 is inspecting bldg. thermal envelope per Table R402.4.1.1; in performance approach Standard Ref. Design for air exchange rate is Specific Leakage Area = 0.00036.
⁴ = in prescriptive approach the bldg. thermal envelope must be both inspected per Table R402.4.1.1 and tested for air changes per hour at 50 Pascals pressure difference, per ASTM E779 or E1827; in performance approach, the Std. Ref. Design for Air exchange rate is 5 ACH⁵₀ in climate zones 1 & 2 and 3 ACH⁵₀ in climate zones 3 - 8.
8th Edition FAQ’s

- **Q. Wall insulation:** Does R13 wall cavity insulation and R-2 continuous insulation comply with wall insulation requirements?

  - **A.** Yes, but only when the wall construction meets the requirements of footnote h. in Table 402.1.1 in the *International Energy Conservation Code 2009*. For example, if the dwelling has typical 2x4 wall construction with structural sheathing throughout, then R13 cavity and R-2 continuous insulation meets the prescriptive code requirement.

- **Q. Wall insulation:** Can I assume that batt insulation which fills a 2x6 wall cavity to be equivalent to R-19?

  - **A.** No. Insulation manufacturers have installation instructions that must be followed to ensure that the specified R value of the batt is met. For example, if insulation is compressed the specified R value may be compromised as can be seen in this literature from one manufacturer [Owens Corning Compression Chart in Excel](#).

- **Q. Roof insulation:** Prior to re-roofing I will remove the entire existing roof covering; must I consider installing insulation?

  - **A.** If the roof is part of the thermal envelope then yes, because exception 5 of Section 101.4.3 of the *International Energy Conservation Code 2009*, only applies as follows: ‘Re-roofing for roofs where neither the sheathing nor the insulation is exposed. Roofs without insulation in the cavity and where the sheathing or insulation is exposed during re-roofing shall be insulated either above or below the sheathing’.

### 2009 IECC

**TABLE 402.4.2 AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA**

*(this is mandatory under current residential code)*

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CRITERIA</th>
</tr>
</thead>
</table>
| barrier and thermal barrier                    | Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.  
|                                                | Breaks or joints in the air barrier are filled or repaired. Air permeable insulation is not used as a sealing material. Air permeable insulation is inside of an air barrier. |
| Ceiling/attic                                  | Air barrier in any dropped ceiling/soffit is substantially aligned with insulation and any gaps are sealed.  
|                                                | Attic access (except unvented attic), knee wall door, or drop down stair is sealed.                                                                                                                       |
| Walls                                          | Corners and headers are insulated.  
|                                                | Junction of foundation and sill plate is sealed.                                                                                                                                                           |
| Windows and doors                              | Space between window/door jambs and framing is sealed.                                                                                                                                                     |
| Rim joists                                     | Rim joists are insulated and include an air barrier.                                                                                                                                                       |
| Floors (including above-garage and cantilevered floors) | Insulation is installed to maintain permanent contact with underside of subfloor decking.  
|                                                | Air barrier is installed at any exposed edge of insulation.                                                                                                                                                 |
| Crawl space walls                              | Insulation is permanently attached to walls.  
|                                                | Exposed earth in unvented crawl spaces is covered with Class I vapor retarder with overlapping joints taped.                                                                                                 |
| Shafts, penetrations                           | Duct shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditioned space are sealed.                                                                                           |
| Narrow cavities                                | Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation.                                                                                                                                                                    |
| Garage separation                              | Air sealing is provided between the garage and conditioned spaces.                                                                                                                                          |
| Recessed lighting                              | Recessed light fixtures are air tight, IC rated, and sealed to drywall.  
|                                                | Exception-fixtures in conditioned space.                                                                                                                                                                  |
| Plumbing and wiring                            | Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring.                                             |
| Shower/tub on exterior wall                    | Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.                                                                                              |
| Electrical/phone box on exterior walls         | Air barrier extends behind boxes or air sealed-type boxes are installed.                                                                                                                                   |
| Common wall                                    | Air barrier is installed in common wall between dwelling units.                                                                                                                                              |
| HVAC register boots                            | HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.                                                                                                                     |
| Fireplace                                      | Fireplace walls include an air barrier.                                                                                                                                                                   |
• **402.4.2.1 Testing option.** Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.

• **Blower Door Tests are currently an option for contractors to use under the 2009 IECC.**

• **404.1 Lighting equipment.** A minimum of 50 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps.
July 2014 requirements 2012 IECC Residential

- **Prescriptive**
  - 0.32 windows (U-value)
  - 0.55 skylights (U-value)
  - R49 ceilings
  - R20 or 13+5 wood walls
  - R13/17 mass walls
  - R30* floor (*minimum R19)
  - R15/19 basement
  - R10, 2ft slab
  - R15/19 crawl space
  - 4cfm/100sq ft duct leakage @ rough
  - 4cfm/100 sq ft duct leakage @ finish
### TABLE R402.4.1.1 AIR BARRIER AND INSULATION INSTALLATION

<table>
<thead>
<tr>
<th>Component</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air barrier and thermal barrier</td>
<td>A continuous air barrier shall be installed in the building envelope. Exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed. Air-permeable insulation shall not be used as a sealing material.</td>
</tr>
<tr>
<td>Ceiling/attic</td>
<td>The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier sealed. Access openings, drop down stair or knee wall doors to unconditioned attic spaces shall be sealed.</td>
</tr>
<tr>
<td>Walls</td>
<td>Corners and headers shall be insulated and the junction of the foundation and sill plate shall be sealed. The junction of the top plate and top of exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.</td>
</tr>
<tr>
<td>Windows, skylights and doors</td>
<td>The space between window/door jambs and framing and skylights and framing shall be sealed.</td>
</tr>
<tr>
<td>Rim joists</td>
<td>Rim joists shall be insulated and include the air barrier.</td>
</tr>
<tr>
<td>Floors (including above-garage and cantilevered floors)</td>
<td>Insulation shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier shall be installed at any exposed edge of insulation.</td>
</tr>
<tr>
<td>Crawl space walls</td>
<td>Where provided in lieu of floor insulation, insulation shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.</td>
</tr>
<tr>
<td>Shafts, penetrations</td>
<td>Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.</td>
</tr>
<tr>
<td>Narrow cavities</td>
<td>Batt insulation shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.</td>
</tr>
<tr>
<td>Garage separation</td>
<td>Air sealing shall be provided between the garage and conditioned spaces.</td>
</tr>
<tr>
<td>Recessed lighting</td>
<td>Recessed light fixtures installed in the building thermal envelope shall be air tight, IC rated, and sealed to the drywall.</td>
</tr>
<tr>
<td>Plumbing and wiring</td>
<td>Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.</td>
</tr>
<tr>
<td>Shower/tub on exterior wall</td>
<td>Exterior walls adjacent to showers and tubs shall be insulated and the air barrier installed separating them from the showers and tubs.</td>
</tr>
<tr>
<td>Electrical/phone box on exterior walls</td>
<td>The air barrier shall be installed behind electrical or communication boxes or air sealed boxes shall be installed.</td>
</tr>
<tr>
<td>HVAC register boots</td>
<td>HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.</td>
</tr>
<tr>
<td>Fireplace</td>
<td>An air barrier shall be installed on fireplace walls. Fireplaces shall have gasketed doors.</td>
</tr>
</tbody>
</table>
• **R402.4.1.2 Testing.**
The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding 5 air changes per hour in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8. 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 creation of all penetrations of the **building thermal envelope**.

During testing: 1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures; 2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures; 3. Interior doors, if installed at the time of the test, shall be open; 4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed; 5. Heating and cooling systems, if installed at the time of the test, shall be turned off; and 6. Supply and return registers, if installed at the time of the test, shall be fully open.
• **R403.1 Controls (Mandatory).**
  At least one thermostat shall be provided for each separate heating and cooling system.

R403.1.1 Programmable thermostat.
Where the primary heating system is a forced-air furnace, at least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain *zone* temperatures down to 55°F (13°C) or up to 85°F (29°C). The thermostat shall initially be programmed with a heating temperature set point no higher than 70°F (21°C) and a cooling temperature set point no lower than 78°F (26°C).
**R403.2 Ducts.**
Ducts and air handlers shall be in accordance with Sections R403.2.1 through R403.2.3.

**R403.2.1 Insulation (Prescriptive).**
Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

Exception: Ducts or portions thereof located completely inside the building thermal envelope.

**R403.2.2 Sealing (Mandatory).**
Ducts, air handlers, and filter boxes shall be sealed. Joints and seams shall comply with either the International Mechanical Code or International Residential Code, as applicable.

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

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

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

**R403.2.2.1 Sealed air handler.**
Air handlers shall have a manufacturer’s designation for an air leakage of no more than 2 percent of the design air flow rate when tested in accordance with ASHRAE 193.

**R403.3 Mechanical system piping insulation (Mandatory).**
Mechanical system piping capable of carrying fluids above 105°F (41°C) or below 55°F (13°C) shall be insulated to a minimum of R-3.

**R403.3.1 Protection of piping insulation.**
Piping insulation exposed to weather shall be protected from damage, including that caused by sunlight, moisture, equipment maintenance, and wind, and shall provide shielding from solar radiation that can cause degradation of the material. Adhesive tape shall not be permitted.
2012 IECC Mechanical / Electrical Requirements (Mandatory)
Residential

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

- **R403.6 Equipment Sizing (Mandatory).**
Heating and cooling equipment shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other *approved* heating and cooling calculation methodologies.

- **R403.7 Systems serving multiple dwelling units (Mandatory).**
Systems serving multiple dwelling units shall comply with Sections C403 and C404 of the IECC—Commercial Provisions in lieu of Section R403.

- **R404.1 Lighting equipment (Mandatory).**
A minimum of 75 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps or a minimum of 75 percent of the permanently installed lighting fixtures shall contain only high efficacy lamps.

  Exception: Low-voltage lighting shall not be required to utilize high-efficiency lamps.

R404.1.1 Lighting equipment (Mandatory).
Fuel gas lighting systems shall not have continuously burning pilot lights.
2012 IECC Residential Performance Alternative

- SECTION R405 SIMULATED PERFORMANCE ALTERNATIVE (PERFORMANCE)

R405.1 Scope.
This section establishes criteria for compliance using simulated energy performance analysis. Such analysis shall include heating, cooling, and service water heating energy only.

R405.2 Mandatory requirements.
Compliance with this section requires that the mandatory provisions identified in Section R401.2 be met. All supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6.

R405.3 Performance-based compliance.
Compliance based on simulated energy performance requires that a proposed residence (proposed design) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the standard reference design. Energy prices shall be taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration’s State Energy Price and Expenditure Report. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.

Exception: The energy use based on source energy expressed in Btu or Btu per square foot of conditioned floor area shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1.

- R405.4 Documentation.
Documentation of the software used for the performance design and the parameters for the building shall be in accordance with Sections R405.4.1 through R405.4.3.
• Current code requirements are based on 2009 IECC (w/ Mass amendments)

• Currently 2012 IECC (w/ Mass amendments) is running concurrently with the 2009 IECC – builders can choose which one they want to use.

• As of July 1, 2014 the 2012 IECC (w/ Mass amendments) will be the only energy code allowed.

• Current Stretch Code Requirements are based on a 2009 IECC base code and making it approx. 20% better than that code. (loosely speaking the stretch code will be the 2012 code as of July 1st)

• Currently, (as of Tuesday Sept. 9th 2013) the state has no current plans to adopt or put forward a new “stretch code”.

• This means that what is in place currently will be the stretch code as of July 1st 2014 (again, which is very similar to the 2012 IECC)