A LOOK INTO THE 2015 IECC RESIDENTIAL PROVISIONS

Presented by:
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WHAT CAN WE EXPECT TO SEE?

- Some consensus on “enough is enough” for now - No real roll backs, no real jumps forward
- Alternative Materials addressed further
- New documentation and inspection requirements
- New definitions and a new climate zone
- A mix-up in “mandatory” requirements
- Clarifications for Insulated Siding
- An overhaul of “footnote h”
- Flexibility in floor insulation requirements
- Table 402.4.1.1 clarification
WHAT CAN WE EXPECT TO SEE?

- Required mechanical rooms
- Clarification on duct insulation and sealing requirements
- Duct testing section overhauled
- Service hot water systems section overhauled
- Pool and spa section rewritten
- New performance path
- New existing buildings’ chapter
When is enough, enough?
Section R102
Construction Documentation
R103

- Submitted details must be able to show full compliance with each code requirement including:
  - Insulation types, locations and R-Values
  - Fenestration types, locations and U-Factors/SHGC
  - Mechanical and water heating size, type and efficiency
  - Equipment and system controls
  - Duct sealing and insulation locations
  - Air sealing details
  - DEPICTION OF THE THERMAL ENVELOPE (R103.2.1)

R103.3: Code Official can hire someone else to do plan review as long as they were/are not affiliated with the design or construction of the building.
List of required inspection mirrors the IBC but clarifies what to look at for energy code compliance:

- **Footing & Foundation**: insulation values, location, thickness, depth and protection.
- **Framing & Rough-in**: insulation values, location, installation, fenestration properties (U-Factor/SHGC) and proper air leakage controls.
- **Plumbing rough-in**: piping insulation values and protection, required controls.
- **Mechanical rough-in**: equipment type and size, controls, piping insulation, system air leakage control, thermostats, dampers, whole-house ventilation, fan efficiency.
- **Final Inspection**: verify installation of all required building systems, equipment and controls and their proper operation, required number of high-efficacy lamps and fixtures.
New Definitions

- Conditioned Space
- Roof Recover, Repair and Replacement
- Insulated siding
- ERI Reference Design and Rated Design

New Climate Zone

R301.4 Tropical Climate Zone defined

R401.2.1: Tropical Zone compliance requirements
Mandatory or Not Mandatory? That is the Question!

• R401.2 Compliance: Must comply with ONE OF THE FOLLOWING
  • R401 through 404
  • R405 and sections in R401 through 404 labeled “Mandatory”
  • ERI approach in Section R406
    • SHOW ME THE ERRATA!!

2012 IECC R401.2 Compliance
INSULATED SIDING PROVISIONS

• Definition makes it a form of continuous insulation with an insulating value of R-2.

• R303.1.1: label the R-value on package and must be listed on certification.

• R303.1.4.1: R-Value determined in accordance with ASTM C 1363. Install per manufacturer’s specs.

• R402.1.2: if used to comply with Table 402.1.2 continuous insulation requirements the labeled R-value is reduced by R-.06.
• **Table 402.1.2, footnote h:** The first value is cavity insulation, the second value is continuous insulation, so “13+5” means R-13 cavity insulation plus R-5 continuous insulation.

  • **EVERYTHING ELSE MOVED TO ITS OWN CODE SECTION!**

• **R402.2.7 Walls with partial structural sheathing:**
  • If required to have continuous insulation and the structural sheathing covers 40% or less of the gross area, you are permitted to reduce the R-value by not more than R-3 or an amount necessary to result in a consistent total sheathing thickness. (reduction doesn’t apply if you use the U-factor alternative or the Total UA alternative)
R402.2.8 FLOOR INSULATION

• New exception that allows for insulation in the floor to not be required to be in contact with the subfloor if you basically build a fully insulated cavity.
<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>AIR BARRIER CRITERIA</th>
<th>INSULATION INSTALLATION CRITERIA</th>
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<tbody>
<tr>
<td>General Requirements</td>
<td>A continuous air barrier shall be installed in the building envelope.</td>
<td>Air-permeable insulation shall not be used as a sealing material.</td>
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<td>Exterior thermal envelope contains a continuous air barrier.</td>
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<td>Breaks or joints in the air barrier shall be sealed.</td>
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<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.</td>
<td>The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.</td>
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<td>Access openings, drop down stair or knee wall doors to unconditioned attic spaces shall be sealed.</td>
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<td>Walls</td>
<td>The junction of the foundation and sill plate shall be sealed.</td>
<td>Corners and headers shall be insulated.</td>
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<td>The junction of the top plate and top of exterior walls shall be sealed.</td>
<td>Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.</td>
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</table>
In Climate Zones 3-8: Build an enclosure within the building to get the appliance and its outside combustion air outside of the building’s thermal envelope. Seal all penetrations and insulate all walls and ceiling of the enclosure according to thermal envelope provisions.

**Build an envelope within the envelope!**
• Insulation (Prescriptive): Attics get R-8 or R-6, elsewhere it’s R-6 and R4.2 (dependent on duct size)

• Sealing (Mandatory): new exceptions brought in if using spray foam products or if there is a static pressure less than 2” w.c. with welded joints and seams or certain locking-type joints and seams.

• Testing (Mandatory): You must test either at rough-in or final and a report provided to the code official, but...

• Duct Leakage (Prescriptive): The amount of leakage can now be traded off.
R403.5 SERVICE HOT WATER SYSTEMS

- R403.5.1 Heated water circulation and temperature maintenance systems (Mandatory): auto control, temperature sensors and pumps shall be accessible...
  - R403.5.1.1 Circulation Systems: has a circulation pump, dedicated return pipe or a cold water supply pipe, controls to turn pump on or off based on demand.
  - R403.5.1.2 Heat trace systems: has controls to automatically adjust the energy input to the heat tracing to maintain desired water temperature in the piping in accordance with the times when heated water is used.

- R403.5.2 Demand recirculation systems: has one or more recirculation pumps that pump water from heated water supply pipe back to the heated water source through a cold water supply pipe with controls that start the pump based on a user present at the fixture and controls the temperature of the water in the cold water piping.

- R403.5.3 Hot water pipe insulation (prescriptive) R-3 required in 7 locations.
R403.10 POOLS AND PERMANENT SPA ENERGY CONSUMPTION (MANDATORY)

- Permanent pools and spas are per IECC R403.10.1 -.4, portable spas (mandatory) are per APSP-15.
  - **Pool heaters** have readily accessible switch that is an integral part of the heater and mounted on exterior of heater or within 3’ of heater. Must be in addition to a circuit breaker for the power to the heater.
  - **Time switches** to turn off and on per a preset schedule, except where public health standards overrule or pumps operate solar and waste heat recover pool heating systems.

- **Covers**: heated outdoor pools and spas must have vapor-retardant cover except where more than 70% of energy for heating is from site-recovered energy source.

- **Residential pools and permanent spas** shall be in accordance with APSP-15.
SECTION R406: ENERGY RATING INDEX COMPLIANCE ALTERNATIVE

• Utilizes an integration of a variety of codes with the thought of offering the greatest flexibility possible

• Mandatory provisions of the 2015 are required (see errata)
  • Air barrier and insulation details
  • Air leakage 3 ACH50 in climate zone 5
  • Duct leakage 4 CFM
  • Mechanical ventilation
  • Equipment sizing
  • Etc.
R406.1 MANDATORY REQUIREMENTS

• The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table 402.1.1 or 402.1.3 of the 2009 International Energy Conservation Code.
TABLE R406.4 MAXIMUM ENERGY RATING INDEX

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<tr>
<th>Climate Zone</th>
<th>Energy Rating Index</th>
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- Compliance based on an ERI analysis requires that the rated design be shown to have an ERI less than or equal to the appropriate value listed in Table R406.3, when compared to the ERI reference design.
SOME THOUGHTS...

• Looks like flexibility is primarily gained in Mechanical equipment because you have to have at least the R-values and U-factors in the thermal envelope of the 2009 IECC
  • Looks like the 2009 Table 402.1.1 become mandatory and tradeoffs that are better than what is listed in the table are OK but not lower. For example we could often trade off Slab edge insulation completely but now it is mandatory.

• Get credit for house orientation with the ERI
• Get credit for 90+ AFUE furnace with the ERI
• Get credit for higher SEER AC units with the ERI
• Get Credit for higher efficiency Water heaters with the ERI
• Get credit for tighter than 3 ACH50 and little to no duct leakage to the outside with the ERI
• Get credit for duct location with the ERI
• Get credit for whole house fan with the ERI
• Get credit for CFL’s above 75% with the ERI
• Get Credit for Appliances with the ERI

• By get credit I mean that it will lower the ERI
CHAPTER 5 (RE): EXISTING BUILDINGS

• This chapter governs (it says controls but does it really control?) alterations, repair, addition and change of occupancy of exiting buildings and structures without requiring unaltered portions of the existing building or building supply system to comply.

• **R501.3 Maintenance**: Buildings shall be maintained in safe and sanitary condition...

• **R501.6 Historic Buildings**: if a report has been submitted to the code official demonstrating that compliance with the provisions of the code would threaten, degrade or destroy the historic form, fabric or function of the building, then the building is exempt.
• Additions:
  • **R502.1.1.1 Building Envelope**: new building envelopes part of an addition shall comply as new construction... exception: if going from nonconditioned to conditioned, the envelope of the addition must comply if the UA, as determined in Section R402.1.4 of the existing building plus the addition and any alterations that are part of the project, is less than or equal to the UA generated for the existing building.
  • **R502.1.1.2 Heating and cooling systems**: new systems must comply as if new construction with the exceptions of duct runs less than 40 linear feet in length in unconditioned spaces don’t have to be tested.
  • **R502.1.1.3 Service hot water systems**: must comply as if it were new construction.
  • **R502.1.1.4 Lighting**: must comply as if it were new construction.
• **R502.1.2 Existing plus addition compliance (Simulated Performance Alternative)**: when going from nonconditioned to condition, the addition shall comply with R405 if the annual energy cost of the addition plus the existing building is modeled to be less than or equal to the addition alone. *WAIT, DID I READ THAT RIGHT?*
• **Sections also exist for Alterations, Repairs and change of occupancy or Use. It's not all cut and paste from Chapter 1 so be sure to read it!**
QUESTIONS?

Me too!
THANK YOU!

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- Plans Analyst/Code Consultant/Inspector/Educator and other duties as assigned😊

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