

# 2018 IECC Code Review

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## Staff Report

# 2018 IECC Commercial Changes Highlights

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- **Commercial**

- Initial estimate of 2-5% energy efficiency improvement.
- Mechanical Section (C 403): Reorganized, so all provisions for a type of equipment or system are in one place
  - Appendix CA Solar-Ready Zone
- Definition of “Approved”: Change from “Approval by the code official as a result of investigation and tests conducted by him or her, or by nationally recognized organizations” to “Acceptable to the code official”
  - ASHRAE 90.1-2016

# Envelope C402.3.1--Heated Slab Insulation

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R-5 continuous insulation required under heated slabs for both commercial and residential(Already in IMC 1209.5.1)



# Table C402.1.4 Garage Door Glazing

- A U-factor of .31 has been added to table 402.1.4 as a minimum requirement for garage doors with glazing.



## C402.2.7 Airspaces

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When the thermal properties of airspaces are calculated as part of the thermal wall assembly, these airspaces must be enclosed in an unvented cavity designed to minimize airflow into and out of the cavity.

## C403.4.4 Expanded Variable Frequency Drives

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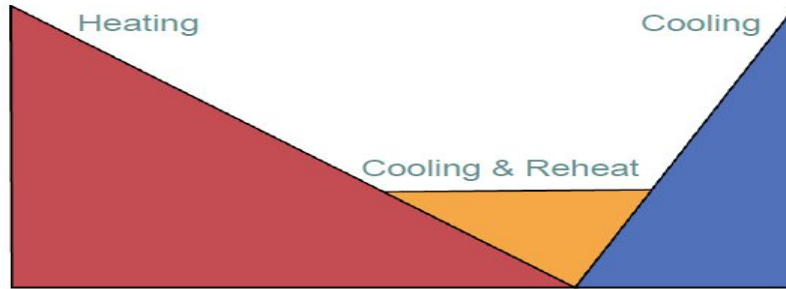
- Controls expanded to include systems greater than or equal to 300,000 BTU. (Was 500,000 BTU)
- Pumps and fans with combined pump motor capacity of 2hp (down from 5hp) must automatically vary flow.

# C403.6.1

# Improved HVAC Turndown W/DDC

- Reduced minimum airflow from 30% to 20% of maximum

2015 IECC



2018 IECC



## C403.7.6 Guestroom Automatic Controls

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- Automatic HVAC control now required for buildings with over 50 guestrooms in Group R-1.

Temperature setpoint controls to raise the cooling setpoint and lower the heating setpoint by not less than 4 degrees from the occupant setpoint within 30 minutes after the occupants have left the guestroom. Raise the cooling setpoint to 80 degrees and the heating setpoint to 60 degrees when unoccupied for 16 hours or a *networked guestroom control system* indicates the room is unrented and unoccupied for more than 30 minutes.



# C404.3 Water Storage Tank Heat Traps

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- Heat Traps now required for hot water storage tanks, not just water heaters.



# C405.2 Luminaire Level Lighting Controls

- Allows for luminaire lighting controls to take the place of centralized controls
- Must include occupancy sensor and ambient light sensor



### Office Area Occupancy Sensors

- Open office areas now must have occupancy sensors.
  - Control zones not greater than 600sf
  - Automatically turn off within 20 minutes
  - General lighting power in ea control zone reduced to not less than 80% of the full zone general lighting in a reasonably uniform pattern within 20 minutes of occupants leaving the zone
  - Daylight responsive controls activate general lighting



## LIGHTING C405.2.3

### Daylight Responsive Exception

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- Does not require daylight-responsive controls if 40% lower than wattage allowance
- Office Allowance—0.79 w/sf
- Threshold for Daylight-responsive controls – 0.47 w/sf

## LIGHTING C405.2.6

### Increased Exterior Lighting Controls

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- Daylight shutoff required-lights shall be automatically turned off when daylight is present.
- Decorative lighting shut off during non-business hours
- Other lighting setback requirements– 30% watts minimum
- Time switch control functionality

## INTERIOR LIGHTING-C405.3.1

### Track Lighting Demand Reduction

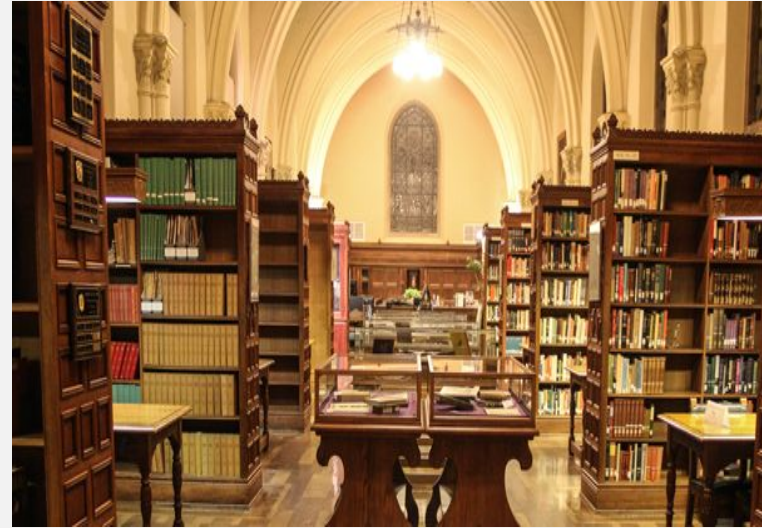
- Reduces demand from 30W/ft to 8W/ft



# INTERIOR LIGHTING POWER ALLOWANCES

## Reduced Lighting Power Allowances

- Office 0.82 to 0.79 – 4% reduction
- Library 1.19 to 0.82 – 32% reduction



## C405.6 AND 405.7

### Increased Efficiencies

- Low voltage dry-type transformers and motors have new efficiency requirements.





## C406 ADDITIONAL EFFICIENCY OPTIONS

### Option Packages

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- Additional option packages are provided such as;
  - Enhanced envelope performance 15% below the total UA of the building thermal envelope in accordance with Section C402.1.5
  - Reduced air infiltration. The measured air-leakage rate of the building envelope shall not exceed .25 cfm/sf under a pressure differential of .3 inches water column.

# C407-TOTAL BUILDING PERFORMANCE

Commercial Renewable Energy Cost reduction Credit Limits

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- A maximum on-site renewable energy cost reduction of 5% is now a component of C407.3 the performance based compliance approach.
- Requires documentation which demonstrates the reduction in energy use associate with on-site renewable energy.
- Clarifies that renewable energy purchased from off-site sources shall be the same in the standard reference design and proposed design.

## C408.1.1 MAINTENANCE INFORMATION

### Operations and Maintenance

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Building O&M must be provided to the building owner.

1. Manufacturer's information.
2. Specifications and recommendations.
3. Programming procedures and data points.
4. Other means of illustrating to the owner how equipment and systems are intended to be maintained and operated.
5. Required maintenance actions shall be clearly stated on readily visible label. Shall include title of maintenance manual or publication number.

## APPENDIX CA ADDED

### SOLAR READY ZONE-COMMERCIAL

- A solar-ready zone shall be located on the roof of buildings that are five stories or less in height above grade plane, and are oriented between 110 degrees and 270 degrees of true north OR have low slope roofs. Exceptions: A building where the licensed design professional (LDP) certifies the solar zone cannot be met because of extensive rooftop equipment, etc. A building with permanently installed on-site renewable energy system. Shaded more than 70% daylight hours. LDP certifies the incident solar radiation available is not suitable.
- The total solar-ready zone shall not be less than 40% of the roof area. Total roof area minus skylights, occupied areas, vegetative areas, mandatory access or setback required by IFC.

# THE ZERO CODE

A lot of talk about a new “Zero Code” similar to California requirements

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The **ZERO Code** provides code-adaptable language defining the energy efficiency and renewable energy requirements (on-site generation and/or off-site procurement) for zero-net-carbon new buildings.

Complying with the **ZERO Code** entails first meeting the minimum prescriptive or performance requirements for building energy efficiency defined by ASHRAE Standard 90.1-2016 (Already a part of IECC). As part of a standardized and predictable process to continue to advance energy efficiency, new standards that exceed ASHRAE Standard 90.1-2016 have been incorporated into the ZERO Code, such as the 2018 International Green Construction Code (IgCC) and ASHRAE Standard 189.1-2017. Newer versions of ASHRAE 90.1, 189.1 and the IGCC will be incorporated as they are published. Once the minimum energy efficiency requirements are met, then the on-site and/or off-site renewable energy is calculated to achieve zero-net-carbon.



# **RESIDENTIAL**

2018 IECC Changes Highlights

# R402.1.2 THERMAL ENVELOPE

## Window U-Factors

- R-5 continuous insulation required under heated slabs
- Modest improvement in window U-factors for Climate Zone 4

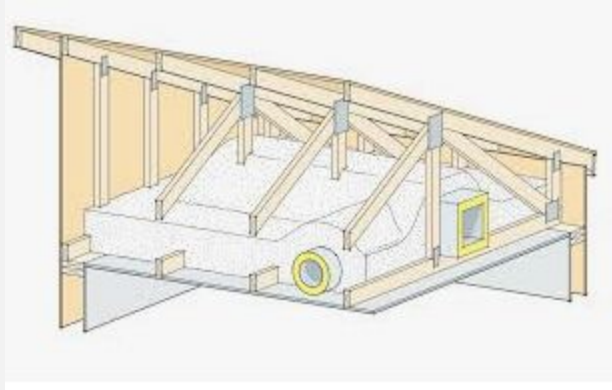


Climate Zone	2015 U-Factor	2018 U-Factor
4	U-0.35	U-0.32

## R403.3.6/403.3.7 THERMAL ENVELOPE

### Ducts Buried in Ceiling Insulation

- Provides allowance for duct insulation in buried duct work (for simulated energy performance analysis)
- 403.3.7-Ducts are considered inside a conditioned space if buried in ceiling insulation per 403.3.6.

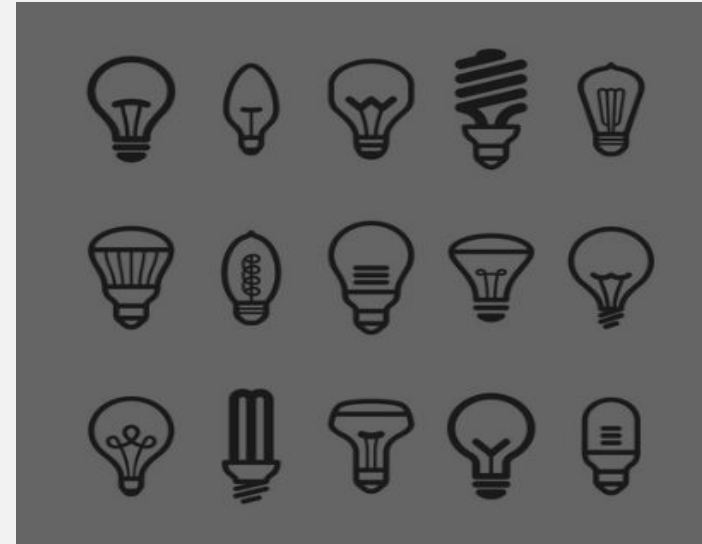




## R404.1-LIGHTING

### High Efficiency Lighting

- Increases high efficiency lighting to 90% from 75%.
- 90% of permanently installed fixtures shall contain only high efficiency lamps.
- Eliminates the low voltage exception.



## TABLE R406.4-MAXIMUM ENERGY RATING INDEX

### Less Stringent Target Requirements

- Increases maximum ERI score from 54 to 62 in climate zone 4.
- Clarifies where on-site renewable energy is included for compliance the building must meet the mandatory requirements of Section R406.2 and the thermal envelope shall be equal to or greater than the requirements of the 2015 IECC.
- The ANSI/RESNET/ICC 301-2014 is now a referenced standard in the code as the basis for ERI calculation. Additionally ANSI/RESNET/ICC 380-2016 is now a referenced standard for building envelope testing.

End Slide: will be shown at the end of City  
Council Meeting presentations

