What’s new in the 2015 Commercial IECC?

City of Scottsdale IECC Adoption
Effective Date – January 1, 2017
2015 IECC
Major Commercial Changes

Improved Energy Efficiency

- 8.7% energy cost savings
- 8.5% source energy savings
- 7.6% site energy savings

ASHRAE 90.1-2013
2015 IECC
Major Commercial Changes
More Information on Construction Documents

- Location of daylight zones on floor plan
- Building thermal envelope represented on plans
- Lighting fixture schedule with wattage and controls
2015 IECC
Major Commercial Changes
Enhanced Inspections

- Sequence of Inspections
  - Footing and foundation
  - Framing and rough-in
  - Plumbing, mechanical and electrical rough-in
  - Final inspection
- Recognition of third-party inspection agencies not affiliated with the building design or construction
2015 IECC
Major Commercial Changes

Buildings Exempt from Envelope Requirements

- **Low-energy buildings**
  - greenhouses

- **Equipment buildings**
  - small buildings designed to house electronic equipment that are no more than 500 ft$^2$
  - intended to house electronic equipment with installed power totaling less than 7 w/ft$^2$ and not intended for human occupancy
  - Buildings with a heating system capacity not greater than 17,000 Btu/hr (5kW) and a heating thermostat set point that is restricted 50° F or less
Alternative Envelope Compliance Path

- **Component Performance Alternative.** Building envelope values and fenestration areas determined with Equation 4-2 shall be permitted in lieu of compliance with the U-, F- and C-factors in Table C402.1.4.

**Equation 4-2**  \[ A + B + C + D + E \leq \text{Zero} \]

- **A** = Sum of UA difference values of building thermal envelope
- **B** = Sum of FL difference values of slab-on-grade perimeter condition
- **C** = Sum of CA difference values of below-grade wall assembly
- **D** = Vertical glazing value
- **E** = Skylight value
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Major Commercial Changes
Expanded Daylighting Requirements

- Skylights and daylighting controls for spaces over 2,500 ft\(^2\), directly under a roof with a ceiling height greater than 15 feet in following spaces:
  - office, lobby, atrium, storage space, gymnasium, exercise center, convention center, retail store, automotive service, non-refrigerated warehouse
  - total daylight zone under skylights shall be not less than half the floor area
2015 IECC
Major Commercial Changes

SHGC values adjusted for Orientation and PF

- Modification based on orientation of fenestration and overhangs (PF)
  - North - vertical fenestration within 45 degrees of true north
  - SEW – orientations other than north
  - Previous values were based on worst case scenario of south, east, west orientations
# 2015 IECC
## Major Commercial Changes
### Fenestration SHGC Adjustment

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical Fenestration (30% or 40% maximum of gross above-grade wall area)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHGC</td>
<td>Orientation</td>
<td>SEW</td>
<td>N</td>
<td>SEW</td>
<td>N</td>
<td>SEW</td>
</tr>
<tr>
<td></td>
<td>PF &lt; 0.2</td>
<td>0.25</td>
<td>0.33</td>
<td>0.25</td>
<td>0.33</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>0.2 ≤ PF &lt; 0.5</td>
<td>0.03</td>
<td>0.37</td>
<td>0.30</td>
<td>0.37</td>
<td>0.30</td>
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<tr>
<td></td>
<td>PF ≥ 0.5</td>
<td>0.04</td>
<td>0.40</td>
<td>0.40</td>
<td>0.40</td>
<td>0.40</td>
</tr>
</tbody>
</table>

PF = A / B
2015 IECC/IMC
Major Commercial Changes

✓ IMC Ventilation for R-2, R-3 and R-4 three stories or less and four stories or more

- Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door, the dwelling unit shall be ventilated by mechanical means in accordance with IMC Section 403
- Provide outside air ventilation per IMC Table 403.3.1.1

IMC 401.2 and 403.3
Higher equipment efficiencies
Motorized dampers to better control outside air intakes and exhaust
Improved energy recovery ventilation systems
Kitchen exhaust airflow rate
Economizers and controls
## 2015 IECC
Major Commercial Changes
Service Water Heating

### Table C404.5.1 – Piping Volume and Maximum Piping Lengths

<table>
<thead>
<tr>
<th>NOMINAL PIPE SIZE (inches)</th>
<th>VOLUME (liquid ounces per foot length)</th>
<th>MAXIMUM PIPING LENGTH (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Public lavatory faucets</td>
</tr>
<tr>
<td>1/4</td>
<td>0.33</td>
<td>6</td>
</tr>
<tr>
<td>5/16</td>
<td>0.5</td>
<td>4</td>
</tr>
<tr>
<td>3/8</td>
<td>0.75</td>
<td>3</td>
</tr>
<tr>
<td>1/2</td>
<td>1.5</td>
<td>2</td>
</tr>
<tr>
<td>5/8</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3/4</td>
<td>3</td>
<td>0.5</td>
</tr>
<tr>
<td>7/8</td>
<td>4</td>
<td>0.5</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>0.5</td>
</tr>
<tr>
<td>11/4</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>11/2</td>
<td>11</td>
<td>0.5</td>
</tr>
<tr>
<td>2 or larger</td>
<td>18</td>
<td>0.5</td>
</tr>
</tbody>
</table>
Return line from the heated-water supply pipe to the heated-water source shall be a dedicated return pipe or a cold water supply pipe.

Controls shall limit the temperature of water entering the cold-water piping to 104°F.

Controls shall start the pump based on the identification of a demand for hot water within the occupancy.

Controls shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is no demand for hot water.
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Major Commercial Changes

Lighting System Power and Controls

1) Occupant or vacancy sensor controls required in more types of spaces
2) Time-switch control requirements
3) Daylight zones and daylight-responsive controls
4) Reduced interior lighting power allowances (watts/sq.ft.)
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Major Commercial Changes

Elevators, Escalators and Moving Walks

- Elevator cabs
  - Luminaires efficacy
  - Ventilation fan efficiency
  - Sleep mode controls

- Escalators and moving walks
  - Regenerative drive
    - supplies electrical energy to building electrical system when escalator is loaded with passengers
Enhanced System Commissioning

Exception: The following systems are exempt from the commissioning requirements:

1. Mechanical systems and service water heater systems in buildings where the total mechanical equipment capacity is less than 40 tons cooling capacity and 50 tons combined service water-heating and space-heating capacity

2. Mechanical systems that serve dwelling units and sleeping units
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Major Commercial Changes

Enhanced System Commissioning

- **Lighting System Functional Testing**
  - Registered design professional shall ensure that lighting control systems are calibrated, adjusted and programmed to operate in accordance with construction documents and manufacturer’s instructions
    1) Occupant sensor controls
    2) Time-switch controls
    3) Daylight responsive controls
2015 IECC
Major Commercial Changes

New Chapter on Existing Buildings

- Historic
- Additions
- Alterations
- Repairs
- Change of Occupancy
C104.4 Approved Inspection Agencies

The code official is authorized to accept reports of third-party inspection agencies not affiliated with the building design or construction.