

2021 International Energy Conservation Code Significant Updates

C401.3 Thermal envelope certificate

The 2021 IECC requires a permanent certificate be posted in an approved location, often the mechanical room, recording the following building information:

- Assembly R-values: roofs, walls, foundations/slabs, basement walls, crawlspace walls and floors, and ducts in unconditioned space
- U-factors and SHGC or fenestration
- Building envelope air leakage test results

Commercial Thermal Envelope Certificate

Name of Designer/Builder: _____ Location (address): _____
 Energy Code Edition: _____
 2021 IECC: Yes No Permit Date: _____
 ASHRAE 90.1-2019 Yes No Permit #: _____
 Other (please indicate): _____ Building Area (sf): _____

1. Insulation Rating

Designation	R-Value (per assembly)	% (of component)	R-Value (area-weighted average)
Ceiling/Roof			
Walls (Above Grade)			
(Above Grade)			
(Below Grade)			
(Below Grade)			

Commercial building pressure testing

The 2021 IECC now requires:

- Buildings or spaces including Group R & I occupancies shall meet **C402.5.2 Dwelling & sleeping unit enclosure testing**
- Buildings or spaces other than Group R & I occupancies shall meet **C402.5.3 Building thermal envelope testing**
- There are no exceptions for Climate Zones 4A & 5A

All new commercial buildings in Illinois must be pressure tested!



C402.5.11 Operable opening interlocks

The 2021 IECC now requires any conditioned space with a door opening larger than 40 sq. ft. to the outdoors shall be provided with controls to change HVAC settings when door is opened:

- Disable heating or lower setpoint to 55°F (or lower)
- Disable cooling or raise setpoint to 90°F (or higher)
- Within 10 minutes of door opening

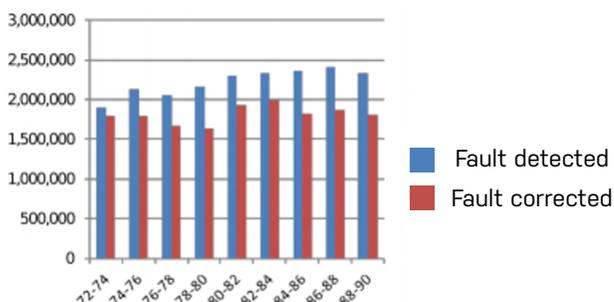


C403.2.3 Fault detection and diagnostics

2018 IECC required fault detection and diagnostics only on economizer systems. In the 2021 IECC whole HVAC system FDD is required for buildings 100,000sf or larger.

- Permanently installed sensors monitoring HVAC performance
- Sample HVAC system performance on 15 min intervals
- Automatically identify and report faults
- Automatically notify authorized personnel
- Automatically prioritize repairs based on data analysis

Energy Impact



C406 Additional efficiency requirements

The 2018 IECC required projects to choose and implement (1) additional efficiency measure.

The 2021 IECC now requires projects to collect 10 points from tables C406.1(1-5). Point values within these tables are based on Occupancy Group.

Illinois amendments propose to add (2) measure options:

- Grid integrated HVAC controls
- Grid integrated water heating controls

TABLE C406.1(1) ADDITIONAL ENERGY EFFICIENCY CREDITS FOR GROUP B OCCUPANCIES

SECTION	CLIMATE ZONE				
	4A	4B	4C	5A	5B
C406.2.1: 5% heating efficiency improvement	NA	NA	NA	1	NA
C406.2.2: 5% cooling efficiency improvement	3	3	2	2	2
C406.2.3: 10% heating efficiency improvement	NA	NA	NA	2	1
C406.2.4: 10% cooling efficiency improvement	5	6	4	4	5
C406.3: Reduced lighting power	8	9	9	7	8
C406.4: Enhanced digital lighting controls	2	2	2	2	2
C406.5: On-site renewable energy	9	9	9	9	9
C406.6: Dedicated outdoor air	5	3	2	5	3
C406.7.2: Recovered or renewable water heating	NA	NA	NA	NA	NA
C406.7.3: Efficient fossil fuel water heater	NA	NA	NA	NA	NA
C406.7.4: Heat pump water heater	NA	NA	NA	NA	NA
C406.8: Enhanced envelope performance	7	4	5	10	7

C405.12 Monitoring

The 2021 IECC requires buildings 25,000sf or larger to have electrical energy monitoring devices installed to track energy use for:

- HVAC systems
- Interior lighting
- Exterior lighting
- Receptacle circuits
- Large process loads
- Building operations/Miscellaneous loads



C405.11 Automatic receptacle control

The 2021 IECC now requires controlled electrical outlets in alignment with ASHRAE 90.1:

- At least 50% of receptacles in all enclosed offices, conference rooms, rooms used primarily for print and/or copy functions, break rooms, classrooms, and individual workstations.
- At least 25% of branch circuit feeders installed for modular furniture not shown on the CDs.
- Can be time of day, occupant, or control signal based function.



R401.2.5 Additional energy efficiency

This new section in the 2021 IECC lays out requirements for improving efficiency over base compliance paths. The target is a 5% improvement.

Requirements differ for the following paths:

- **Prescriptive Compliance**
- **Total Building Performance Compliance**
- **Energy Rating Index Compliance**
- **Passive House Certified:**

No additional requirements for Phius certified projects in Illinois (proposed by amendment).



Residential duct pressure testing

R403.3.5 Duct testing: 25 Pa pressure test unchanged

- Ducts serving non-integral ventilation exempted (HRV/ERVs)

R403.3.6 Duct leakage: 4.0cfm/100sf (with air handler)
3.0cfm (without AH)

- **New requirement:** 8.0cfm/100sf of floor area for ducts entirely within thermal envelope.

Duct testing now required regardless of location!



R403.6.3 Testing (mechanical ventilation systems)

The 2021 IECC now requires all installed ventilation fans to be **TESTED** in order to verify performance.

This section aims to reduce issues from poor installation such as excessive duct length and multiple bends that often reduce rated flow.

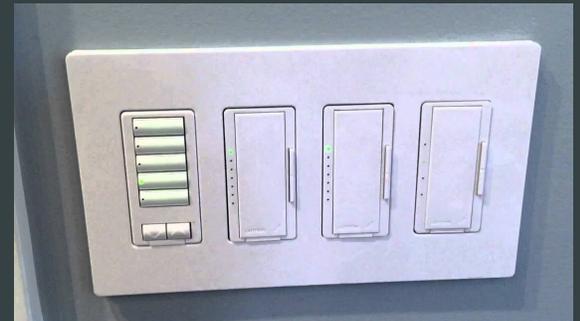
Exception: kitchen range hoods with 6" duct & no more than 1 bend.

Residential interior & exterior lighting controls

R404.2 Interior lighting controls: The 2021 IECC now requires permanently installed fixtures to have dimmer, occupant sensor control, or other control built into fixture. Exceptions apply to some spaces.

R404.3 Exterior lighting controls: The 2021 IECC now also requires permanently installed outdoor lighting (> 30W total power) to turn off with adequate daylight.

- Can be time clock or photocell controlled



WHO WE ARE

Have a Question About the Energy Code? Contact Us.

SEDAC is the Energy Code Training Provider on behalf of the Illinois EPA Office of Energy. Attend SEDAC's workshops and webinars to learn more. We also offer online courses and technical support.

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