

**ORDINANCE NO. 14**  
**Series of 2018**

**AN ORDINANCE OF THE TOWN OF CARBONDALE, COLORADO AMENDING  
CHAPTER 18, ARTICLE 7 OF THE MUNICIPAL CODE OF THE TOWN OF  
CARBONDALE REGARDING THE INTERNATIONAL ENERGY CONSERVATION  
CODE**

WHEREAS, by Ordinance No. 7, Series of 2011, the Town of Carbondale adopted the International Energy Conservation Code, which provides minimum requirements and standards regulating the design and construction of buildings for effective use of energy; and

WHEREAS, after approximately seven years of operation, the Board of Trustees finds and determines that certain amendments to the International Energy Conservation Code are in the interest of the public health, safety and welfare;

NOW THEREFORE, BE IT ORDAINED BY THE BOARD OF TRUSTEES OF THE TOWN OF CARBONDALE, COLORADO that the Town of Carbondale Municipal Code shall be amended as follows:

1. The foregoing recitals are hereby adopted as findings and determinations of the Board of Trustees.

2. Chapter 18, Article 7 of the Town of Carbondale Municipal Code shall be amended by deleting the language stricken and adding the language underlined to read as follows:

**Sec. 18-7-10. Adoption.**

Pursuant to Part 2 of Article 16 of Title 31, C.R.S., there is adopted as the energy conservation code for the Town, by reference thereto, the International Energy Conservation Code, ~~2009~~ 2015 edition, as published by the International Code Council, 4051 Flossmoor Road, Country Club Hills, Illinois 60478. The purpose of the adopted code is to provide minimum requirements and standards regulating the design and construction of buildings regarding the effective use of energy. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve the effective use of energy.

**Sec. 18-7-20. Copy on file.**

At least one copy of the International Energy Conservation Code, certified to be a true copy, has been and is now on file in the office of the Town Clerk and may be inspected by any interested person during regular business hours.

**Sec. 18-7-30. Amendments.**

The code adopted herein is hereby modified by the following amendments:

- (1) Section C101 and R101, Scope and general requirements, is hereby amended by replacing [Name of Jurisdiction] with “Town of Carbondale.”
- (2) Section 103, Construction documents, is hereby amended to include the following provision:  
  
“103.2.1 COMcheck Reports are required for all new commercial and multi-family submittals over 3 stories when using the prescriptive approach.”
- (3) Section C301 Climate Zones is hereby amended to include the following provision:  
  
C301.1.1 Carbondale is in the 6B climate zone.

#### **IECC Residential Provisions (R Chapters)**

- (4) R202 is hereby amended to add the following definition:  
  
**Dwelling Unit Enclosure Area:** The sum of all the boundary surfaces that define the *dwelling unit*, including top/ceiling, bottom/floor, and all side walls. This does not include interior partition walls within the *dwelling unit*. Wall height should be measured from the finished floor of the *dwelling unit* to the underside of the floor above (rather than stopping at the finished ceiling).
- (5) Section R301 Climate Zones is hereby amended to include the following provision:  
  
R301.1.1 Carbondale is in the 6B climate zone.
- (6) **R401.2 Compliance.**  
  
Projects shall comply with one of the following:
  1. Sections R401 through R404.
  2. Section R405 and the provisions of Sections R401 through R404 labeled “Mandatory.”
  3. An energy rating index (ERI) approach in Section R406 and the provisions of Sections R401 through R404 labeled “Mandatory.”
- (7) **R402.4.1.2 Testing.**

The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding five air changes per hour in Climate Zones 1 and 2, and three air changes per hour or 0.24 cubic feet per minute at 50 pascals/square foot of dwelling unit enclosure area in Climate Zones 3 through 8. Testing shall be conducted in accordance with ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inch 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.

(8) **R403.6 Mechanical ventilation (Mandatory).**

The building shall be provided with ventilation that meets the requirements of the International Residential Code or International Mechanical Code or per equation 4-1, 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.

**R403.6.1 Whole-House mechanical ventilation system fan efficacy.**

~~Mechanical~~ Fans used to provide whole-house mechanical ventilation ~~system fans~~ shall meet the efficacy requirement of Table R403.6.1.

Exceptions: Where ~~mechanical ventilation fans are an~~ air handler that is integral to tested and listed HVAC equipment is used to provide whole-house mechanical ventilation ~~they~~ the air handler shall be powered by an electronically commutated motor.

**Table R403.6.1**  
**WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM FAN EFFICACY**

Fan Location	Air Flow Rate Minimum (CFM)	Minimum Efficacy (CFM/Watt)	Air Flow Rate Maximum (CFM)
<u>HRV or ERV</u>	<u>Any</u>	<u>1.2 cfm/watt</u>	<u>Any</u>
Range hoods	Any	2.8 cfm/watt	Any
In-line fan	Any	2.8 cfm/watt	Any
Bathroom, utility room	10	1.4 cfm/watt	<90
Bathroom, utility room	90	2.8 cfm/watt	Any

(9) **Section R404.2 Electrical energy consumption (Mandatory)**

Each dwelling unit located in a Group R-2 building shall have a separate electrical meter.

(10) **SECTION R406 ENERGY RATING INDEX COMPLIANCE  
ALTERNATIVE**

**R406.1 Scope.** This section establishes criteria for compliance using an Energy Rating Index (ERI) analysis.

**R406.2 Mandatory requirements.** Compliance with this section requires that the mandatory provisions identified in Sections R401.2 ~~through R404~~ indicated as “Mandatory” and Section R403.5.3 be met.

The *building thermal envelope* shall be greater than or equal to levels of efficiency and *Solar Heat Gain Coefficient* in Table 402.1.2 ~~1~~ or 402.1.4 ~~3~~ of the 2009 *International Energy Conservation Code*.

**Exception:** Supply and return ducts not completely inside the *building thermal envelope* shall be insulated to an R-value of not less than ~~minimum of~~ R-6.

**R406.3 Energy Rating Index.** The Energy Rating Index (ERI) shall be determined in accordance with RESNET/ICC 301 except for buildings covered by the *International Residential Code*, the ERI Reference Design Ventilation rate shall be in accordance with Equation 4-1.

**Equation 4-1**

Ventilation rate: CFM = (0.01 x total square foot area of house) + [7.5 x (number of bedrooms +1)]

~~a numerical integer value that is based on a linear scale constructed such that the ERI reference design has an Index value of 100 and a residential building that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1 percent change in the total energy use of the rated design relative to the total energy use of the ERI reference design. The ERI shall consider all energy used in the residential building.~~

Energy use to recharge or refuel a vehicle used for transportation on roads that are not on the building site shall not be included in the ERI reference design or the rated design.

**R406.3.1 ERI reference design.** ~~The ERI reference design shall be configured such that it meets the minimum requirements of the 2006 International Energy~~

~~Conservation Code prescriptive requirements. The proposed residential building shall be shown to have an annual total normalized modified load less than or equal to the annual total loads of the ERI reference design.~~

**R406.4 ERI-based compliance.** 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~~ indicated in Table R406.4 when compared to the *ERI reference design*.

**TABLE R406.4 MAXIMUM ENERGY RATING INDEX**

CLIMATE ZONE	ENERGY RATING INDEX
1	<del>52</del> <u>57</u>
2	<del>52</del> <u>57</u>
3	<del>54</del> <u>57</u>
4	<del>54</del> <u>62</u>
5	<del>55</del> <u>61</u>
6	<del>54</del> <u>61</u>
7	<del>53</del> <u>58</u>
8	<del>53</del> <u>58</u>

a. Where onsite renewable energy is included for compliance using the ERI analysis of Section R406.4, the building shall meet the mandatory requirements of Section R406.2, and the building thermal envelope shall be greater than or equal to the levels of the efficiency and SHGC in Table R402.1.2 or Table R402.1.4 of the 2015 *International Energy Conservation Code*.

**R406.5 Verification by approved agency.** Verification of compliance with Section R406 as modified herein shall be completed by an *approved* third party.

**R406.6 Documentation.** Documentation of the software used to determine the ERI and the parameters for the residential building shall be in accordance with Sections R406.6.1 through R406.6.3

**R406.6.1 Compliance software tools.** Software tools used for determining the ERI shall be Approved Software Rating Tools in accordance with RESNET/ICC301. ~~Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the code official.~~

**R406.6.2 Compliance report.** Compliance software tools shall generate a report that documents that the ERI of the *rated design* complies with Sections R406.3 and R406.4. The compliance documentation shall include the following information:

1. Address or other identification of the residential building.
2. An inspection checklist documenting the building component characteristics of the *rated design*. The inspection checklist shall show results for both the *ERI reference design* and the *rated design*, and shall document all inputs entered by the user necessary to reproduce the results.
3. Name of individual completing the compliance report.
4. Name and version of the compliance software tool.

**Exception:**

~~Multiple orientations.~~ Where an otherwise identical building model is offered in multiple orientations, compliance for any orientation shall be permitted by documenting that the building meets the performance requirements in each of the four (north, east, south and west) cardinal orientations.

**R406.6.3 Additional documentation.** The *code official* shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the *ERI reference design*.
2. A certification signed by the builder providing the building component characteristics of the *rated design*.
3. Documentation of the actual values used in the software calculations for the *rated design*.

**R406.6.4 Specific approval.** Performance analysis tools meeting the applicable sections of R406 shall be *approved*. Documentation demonstrating the approval of performance analysis tools in accordance with Section R406.6.1 shall be provided.

**R406.6.5 Input values.** Where calculation require input values not specified by sections R402, R403, R404 and R405, those input values shall be taken from RESNET/ICC 301.

~~**R406.7 Calculation software tools.** Calculation software, where used, shall be in accordance with Sections R406.7.1 through R406.7.3~~

~~**R406.7.1 Minimum capabilities.** Calculation procedures used to comply with this section shall be software tools capable of calculating the ERI as described in Section R406.3, and shall include the following capabilities:~~

1. Computer generation of the *ERI reference design* using only the input for the *rated design*. The calculation procedure shall not allow the user to directly modify the building component characteristics of the *ERI reference design*.

2. Calculation of whole building, as a single *zone*, sizing for the heating and cooling equipment in the *ERI reference design* residence in accordance with Section R403.7.

3. Calculations that account for the effects of indoor and outdoor temperatures and part load ratios on the performance of heating, ventilating and air conditioning equipment based on climate and equipment sizing.

4. Printed *code official* inspection checklist listing each of the *rated design* component characteristics determined by the analysis to provide compliance, along with their respective performance ratings.

**~~R406.7.2 Specific approval.~~** Performance analysis tools meeting the applicable sections of Section R406 shall be *approved*. Tools are permitted to be *approved* based on meeting a specified threshold for a jurisdiction. The *code official* shall approve tools for a specified application or limited scope.

**~~R406.7.3 Input values.~~** When calculations require input values not specified by Sections R402, R403, R404 and R405, those input values shall be taken from an approved source.

## IECC- Commercial (C Chapters)

(11) **C408.1 General.** This section covers the commissioning of the building mechanical systems in section C403, service water heating systems in Section C404, and electrical power and lighting systems in Section 405.

(12) **C408.2.4 Preliminary commissioning report.** A preliminary report of commissioning test procedures and results shall be completed and certified by the registered design professional or approved agency and provided to the building owner or owner's authorized agent. The report shall be organized with mechanical and service hot water findings in separate sections to allow independent review. The report shall be identified as "Preliminary Commissioning Report" and shall include the completed Commissioning Compliance Checklist as shown in Table C408.2.4.1 and shall identify:

1. Itemization of deficiencies found during testing required by this section that have not been corrected at the time of report preparation.

2. Deferred tests that cannot be performed at the time of report preparation because of climatic conditions.
3. Climatic conditions required for performance of the deferred tests.
4. Results of functional performance tests.
5. Functional performance test procedures used during the commissioning process including measurable criteria for test acceptance.

**TABLE C408.2.4.1**  
**Commissioning Compliance Checklist**



Project Information

Project Name:

Project Address:

Commissioning Authority:

Commissioning Plan (Section C408.2.1)

Commissioning Plan was used during construction and includes all items required by Section C408.2.1  
Systems Adjusting and Balancing has been completed: \_\_\_\_\_

HVAC Equipment Functional Testing has been executed. If applicable, deferred and/or follow-up testing  
is scheduled to be provided on: \_\_\_\_\_

HVAC Controls Functional Testing has been executed. If applicable, deferred and/or follow-up testing is  
scheduled to be provided on: \_\_\_\_\_

Economizers Functional Testing has been executed. If applicable, deferred and/or follow-up testing is  
scheduled to be provided on: \_\_\_\_\_

Lighting Controls Functional Testing has been executed. If applicable, deferred and/or follow-up testing  
is scheduled to be provided on: \_\_\_\_\_

Service Water Heating System Functional Testing has been executed. If applicable, deferred and/or  
follow up testing is scheduled to be provided on: \_\_\_\_\_

Manual, record documents, and training have been completed or scheduled: \_\_\_\_\_

Preliminary Commissioning Report submitted to owner and includes all items required by Section  
C408.2.4: \_\_\_\_\_

I hereby certify that the commissioning provider has provided me with evidence of mechanical, service  
water heating, and lighting systems commissioning in accordance with the 2018 IECC.

Signature of Building Owner or Owner's Representative

Date

- \_\_\_\_\_  
\_\_\_\_\_
- (13) **C408.2.4.1 Acceptance of report.** Buildings, or portions thereof, shall not be considered acceptable for a final inspection pursuant to Section ~~C104.3~~ C104.2.6 until the code official has received ~~a letter of transmittal~~ the Preliminary Commissioning Report from ~~the building owner acknowledging that the building owner or owner's authorized agent has received the Preliminary Commissioning Report.~~
- (14) **C501.4 Compliance.** Alterations, repairs, additions and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions for alterations, repairs, additions and changes of occupancy or relocation, respectively, in the International Building Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International

Plumbing Code, International Property Maintenance Code, International Existing Building Code, International Private Sewage Disposal Code and NFPA 70.

- (15) **C503.1 General.** Alterations to any building or structure shall comply with the requirements of the code for new construction. Alterations shall be such that the existing building or structure is no less conforming to the provisions of this code than the existing building or structure was prior to the alteration. Alterations to an existing building, building system or portion thereof shall conform to the provisions of this code as those provisions relate to new construction without requiring the unaltered portions of the existing building or building system to comply with this code. Alterations shall not create an unsafe or hazardous condition or overload existing building systems.

Alterations complying with ANSI/ASHRAE/IESNA 90.1. need not comply with Sections C402, C403, C404 and C405.

Exception: The following alterations need not comply with the requirements for new construction, provided the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.
2. Surface-applied window film installed on existing single-pane fenestration assemblies reducing solar heat gain, provided the code does not require the glazing or fenestration to be replaced.
3. Existing ceiling, wall or floor cavities exposed during construction, provided that these cavities are filled with insulation.
4. Construction where the existing roof, wall or floor cavity is not exposed.
5. Roof recover.
6. Air barriers shall not be required for roof recover and roof replacement where the alterations or renovations to the building do not include alterations, renovations or repairs to the remainder of the building envelope.
7. ~~Alterations that replace less than 50 percent of the luminaires in a space, provided that such alterations do not increase the installed interior lighting power.~~

3. If any ordinance or parts of ordinances are in conflict with the standards set forth in this Ordinance, they are hereby repealed to the extent of such conflict only.

4. This Ordinance shall be effective upon posting and publication in accordance with the Carbondale Home Rule Charter.

INTRODUCED, READ AND PASSED THIS \_\_\_\_ day of \_\_\_\_\_, 2018.

TOWN OF CARBONDALE, COLORADO  
a Colorado home rule municipal corporation,

\_\_\_\_\_  
Dan Richardson, Mayor

ATTEST:

\_\_\_\_\_  
Cathy Derby, Town Clerk

POSTED: \_\_\_\_\_

PUBLISHED: \_\_\_\_\_

EFFECTIVE: \_\_\_\_\_