Colorado Model Low Energy and Carbon Code

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INTRODUCTION

The *Colorado Model Low Energy and Carbon Code* was developed by the Energy Code Board pursuant to Colorado House Bill 22-1362, C.R.S. 24-38.5-401. The model code becomes the state minimum energy code that a municipality or county can adopt when updating or adopting any other building code beginning July 1, 2026.

The *Colorado Model Low Energy and Carbon Code*—Commercial Provisions shall be the Commercial Provisions of the *International Energy Conservation Code*® (IECC®), 2024 Edition, as published by the International Code Council® (ICC®) and as amended by the Energy Code Board. The *Colorado Model Low Energy and Carbon Code*—Residential Provisions shall be the Residential Provisions of the *International Energy Conservation Code*, 2024 Edition, as published by the International Code Council and as amended by the Energy Code Board. The scope, intent, and all definitions and requirements of the code shall be as published in the 2024 *International Energy Conservation Code*, unless amended by the Energy Code Board.

PREFACE

ABOUT THE I-CODES

The 2024 I-Codes, published by the ICC, are 15 fully compatible titles intended to establish provisions that adequately protect public health, safety and welfare; that do not unnecessarily increase construction costs; that do not restrict the use of new materials, products or methods of construction; and that do not give preferential treatment to particular types or classes of materials, products or methods of construction.

The I-Codes are updated on a 3-year cycle to allow for new construction methods and technologies to be incorporated into the codes. Alternative materials, designs and methods not specifically addressed in the I-Code can be approved by the building official where the proposed materials, designs or methods comply with the intent of the provisions of the code.

The I-Codes are used as the basis of laws and regulations in communities across the US and in other countries. They are also used in a variety of nonregulatory settings, including:

- Voluntary compliance programs.
- The insurance industry.
- Certification and credentialing for building design, construction and safety professionals.
- Certification of building and construction-related products.
- Facilities management.
- “Best practices” benchmarks for designers and builders.
- College, university and professional school textbooks and curricula.
- Reference works related to building design and construction.

Code Development Process

The code development process regularly provides an international forum for building professionals to discuss requirements for building design, construction methods, safety, performance, technological advances and new products. Proposed changes to the I-Codes, submitted by code enforcement officials, industry representatives, design professionals and other interested parties, are deliberated through an open code development process in which all interested and affected parties may participate.

Openness, transparency, balance, due process and consensus are the guiding principles of both the ICC Code Development Process and OMB Circular A-119, which governs the federal government’s use of private-sector standards. The ICC process is open to anyone without cost. Remote participation is available through cdpAccess®, the ICC’s cloud-based app.

In order to ensure that organizations with a direct and material interest in the codes have a voice in the process, the ICC has developed partnerships with key industry segments that support the ICC’s important public safety mission. Some code development committee members were nominated by the following industry partners and approved by the ICC Board:

- American Gas Association (AGA)
- American Institute of Architects (AIA)
- American Society of Plumbing Engineers (ASPE)
- International Association of Fire Chiefs (IAFC)
- National Association of Home Builders (NAHB)
- National Association of State Fire Marshals (NASFM)
- National Council of Structural Engineers Association (NCSEA)
- National Multifamily Housing Council (NMHC)
- Plumbing Heating and Cooling Contractors (PHCC)
- Pool and Hot Tub Alliance (PHTA), formerly The Association of Pool and Spa Professionals (APSP)

Code development committees evaluate and make recommendations regarding proposed changes to the codes. Their recommendations are then subject to public comment and council-wide votes. The ICC's governmental members—public safety officials who have no financial or business interest in the outcome—cast the final votes on proposed changes.

The I-Codes are subject to change through future code development cycles and by any governmental entity that enacts the code into law. For more information regarding the code development process, contact the Codes and Standards Development Department of the ICC at iccsafe.org/products-and-services/i-codes/code-development/.

While the I-Code development procedure is thorough and comprehensive, the ICC, its members and those participating in the development of the codes expressly disclaim any liability resulting from the publication or use of the I-Codes, or from compliance or noncompliance with their provisions. NO WARRANTY OF ANY KIND, IMPLIED, EXPRESSED OR STATUTORY, IS GIVEN WITH RESPECT TO THE I-CODES. The ICC does not have the power or authority to police or enforce compliance with the contents of the I-Codes.

Coordination of the I-Codes

The coordination of technical provisions allows the I-Codes to be used as a complete set of complementary documents. Individual codes can also be used in subsets or as stand-alone documents. Some technical provisions that are relevant to more than one subject area are duplicated in multiple model codes.

Marginal Markings

➡ = Indicates where an entire section, paragraph, exception or table has been deleted or an item in a list of items or a table has been deleted from the 2024 edition of the International Code.

| = Indicates a technical change from the requirements of the 2024 edition of the International Code.

> = Indicates international model code language deleted by Colorado.

|| = Indicates a State of Colorado amendment has been made to the International Code.

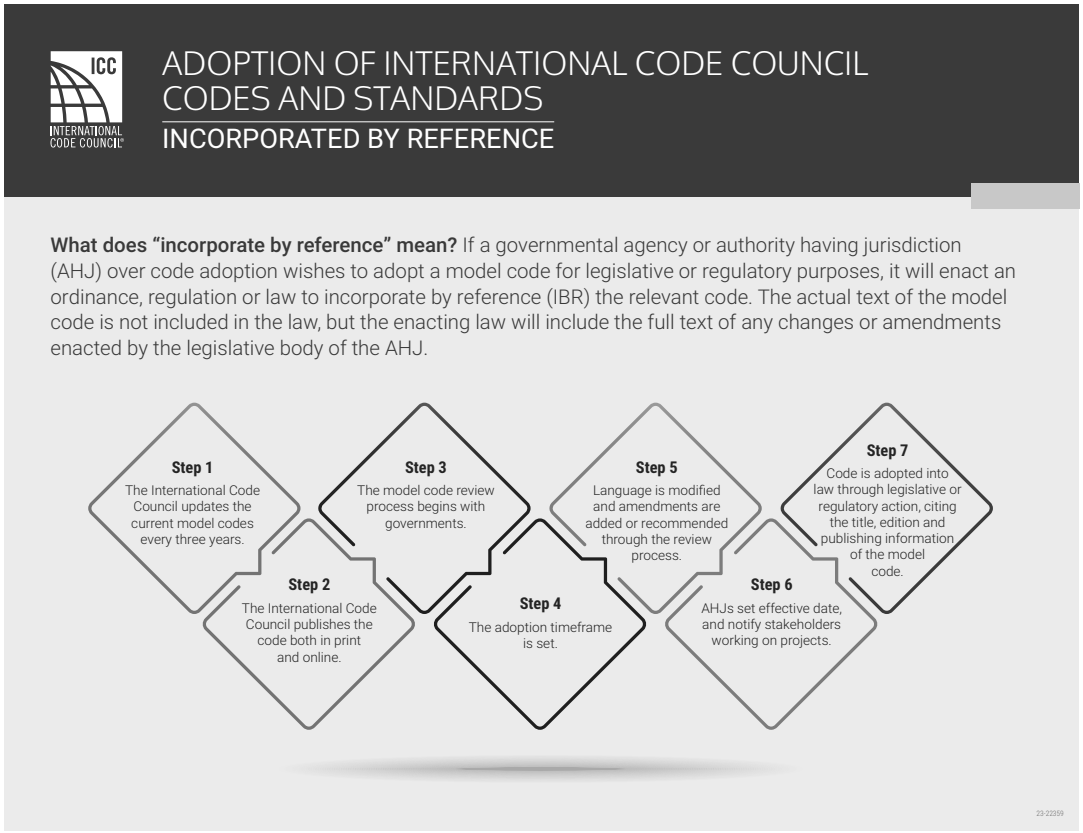
Italicized Terms

Words and terms defined in Chapter 2, Definitions, are italicized where they appear in code text and the Chapter 2 definitions apply. Although care has been taken to ensure applicable terms are italicized, there may be instances where a defined term has not been italicized or where a term is italicized but the definition found in Chapter 2 is not applicable. For example, Chapter 2 of the *International Building Code*® (IBC®) contains a definition for "*Listed*" that is applicable to equipment, products and services. The term "listed" is also used in that code to refer to a list of items within the code or within a referenced document. For the latter, the Chapter 2 definition would not be applicable.

Adoption of International Code Council Codes and Standards

The International Code Council maintains a copyright in all of its codes and standards. Maintaining copyright allows the Code Council to fund its mission through sales of books in both print and digital format. The Code Council welcomes incorporation by reference of its codes and standards by jurisdictions that recognize and acknowledge the Code Council's copyright in the codes and standards, and further acknowledge the substantial shared value of the public/private partnership for code development between jurisdictions and the Code Council. By making its codes and standards available for incorporation by reference, the Code Council does not waive its copyright in its codes and standards.

The Code Council's codes and standards may only be adopted by incorporation by reference in an ordinance passed by the governing body of the jurisdiction. "Incorporation by reference" means that in the adopting ordinance, the governing body cites only the title, edition, relevant sections or subsections (where applicable), and publishing information of the model code or standard, and the actual text of the model code or standard is not included in the ordinance (see graphic, "Adoption of International Code Council Codes and Standards"). The Code Council does not consent to the reproduction of the text of its codes or standards in any ordinance. If the governing body enacts any changes, only the text of those changes or amendments may be included in the ordinance.



The Code Council also recognizes the need for jurisdictions to make laws accessible to the public. Accordingly, all I-Codes and I-Standards, along with the laws of many jurisdictions, are available to view for free at codes.iccsafe.org/codes/i-codes. These documents may also be purchased, in both digital and print versions, at shop.iccsafe.org.

To facilitate adoption, some I-Code sections contain blanks for fill-in information that needs to be supplied by the adopting jurisdiction as part of the adoption legislation. For example, the IECC contains:

Section C101.1. Insert: **[NAME OF JURISDICTION]**

Section R101.1. Insert: **[NAME OF JURISDICTION]**

For further information or assistance with adoption, including a sample ordinance, jurisdictions should contact the Code Council at incorporation@iccsafe.org.

For a list of frequently asked questions (FAQs) addressing a range of foundational topics about the adoption of model codes by jurisdictions and to learn more about the Code Council's code adoption resources, scan the QR code or visit iccsafe.org/code-adoption-resources.

INTRODUCTION TO THE INTERNATIONAL ENERGY CONSERVATION CODE

The standards development process regularly provides an international forum for building professionals to discuss requirements for building design, construction methods, safety, performance, technological advances and new products. Proposed changes to the I-Codes developed through ICC Standards Consensus Procedures, submitted by code enforcement officials, industry representatives, design professionals and other interested parties, are deliberated through an open standards development process in which all interested and affected parties may participate.

Openness, transparency, balance, due process and consensus are the guiding principles of both the ICC Codes and Standards Development Processes and OMB Circular A-119, which governs the federal government's use of private-sector standards. The ICC process is open to anyone without cost. Remote participation is available through cdpAccess®, the ICC's cloud-based app.

In order to ensure that organizations with a direct and material interest in the codes have a voice in the process, the ICC has encouraged participation of key industry segments that support the ICC's important public safety mission.

Code development committees, using the Standards Consensus Procedures, evaluate proposed changes to the codes. After public comments are reviewed, the committee members vote to approve changes.

ARRANGEMENT AND FORMAT OF THE 2024 IECC

The IECC contains two separate sets of provisions—one for commercial buildings and one for residential buildings. Each set of provisions is applied separately to buildings within their scope. The IECC—Commercial Provisions apply to all buildings except for residential buildings three stories or less in height. The IECC—Residential Provisions apply to detached one- and two-family dwellings and multiple single-family dwellings as well as Group R-2, R-3 and R-4 buildings three stories or less in height. These scopes are based on the definitions of "Commercial building" and "Residential building," respectively, in Chapter 2 of each set of provisions. Note that the IECC—Commercial Provisions therefore contain provisions for residential buildings four stories or greater in height.

The following table shows how the IECC is divided. The chapter synopses detail the scope and intent of the provisions of the IECC.

CHAPTER TOPICS	
Chapter	**Subjects**
1 and 2	Administration and definitions
3	Climate zones and general materials requirements
4	Energy efficiency requirements
5	Existing buildings
6	Referenced standards
Appendices CA/RA	Board of appeals
Appendices CC/RC	Zero energy building provisions
Appendix CD	The 2030 glide path
Appendix CE	Required HVAC total system performance ratio (TSPR)
Appendix CF	Energy credits
Appendices CJ/RD	Electric energy storage provisions
Appendices CK	Renewable energy sources
Appendix RF	Alternative building thermal envelope insulation *R*-value options
Appendix RG	2024 IECC stretch code
Appendix RH	Operational carbon rating and energy reporting
Appendix RI	On-site renewable energy
Appendix RL	Renewable energy infrastructure

Chapter 1 Scope and Administration.

Chapters 1 [CE] and 1 [RE] establish the limits of applicability of the code and describe how the code is to be applied and enforced. The provisions of Chapter 1 establish the authority and duties of the code official appointed by the authority having jurisdiction and also establish the rights and privileges of the design professional, contractor and property owner.

Chapter 2 Definitions.

Chapters 2 [CE] and 2 [RE] are the repository of the definitions of terms used in the body of the code. The user of the code should be familiar with and consult these chapters because the definitions are essential to the correct interpretation of the code and because the user may not be aware that a term is defined.

Chapter 3 General Requirements.

Chapters 3 [CE] and 3 [RE] specify the climate zones that will serve to establish the exterior design conditions. In addition, Chapter 3 provides interior design conditions that are used as a basis for assumptions in heating and cooling load calculations, and provides basic material requirements for insulation materials and fenestration materials. Climate has a major impact on the energy use of most buildings. The code establishes many requirements such as wall and roof insulation *R*-values, window and door thermal transmittance (*U*-factors) and provisions that affect the mechanical systems based on the climate where the building is located. This chapter contains information that will be used to properly assign the building location into the correct climate zone and is used as the basis for establishing or eliminating requirements.

Chapter 4 Energy Efficiency.

Chapter 4 [CE] contains the energy-efficiency-related requirements for the design and construction of most types of commercial buildings and residential buildings greater than three stories in height above grade. This chapter defines requirements for the portions of the building and building systems that impact energy use in new commercial construction and new residential construction greater than three stories in height, and promotes the effective use of energy. In addition to energy conservation requirements

for the building envelope, this chapter contains requirements that impact energy efficiency for the HVAC systems, the electrical systems and the plumbing systems. It should be noted, however, that requirements are contained in other codes that have an impact on energy conservation. For instance, requirements for water flow rates are regulated by the *International Plumbing Code*.

Chapter 4 [RE] contains the energy-efficiency-related requirements for the design and construction of residential buildings regulated under this code. It should be noted that the definition of a residential building in this code is unique for this code. In this code, residential buildings include detached one- and two-family dwellings and multiple single-family dwellings as well as R-2, R-3 or R-4 buildings three stories or less in height. All other buildings, including residential buildings greater than three stories in height, are regulated by the energy conservation requirements in the IECC—Commercial Provisions. The applicable portions of a residential building must comply with the provisions within this chapter for energy efficiency. This chapter defines requirements for the portions of the building and building systems that impact energy use in new residential construction and promotes the effective use of energy. The provisions within the chapter promote energy efficiency in the building envelope, the heating and cooling system and the service water-heating system of the building.

Chapter 5 Existing Buildings.

Chapters 5 [CE] and 5 [RE] contain the technical energy efficiency requirements for existing buildings. Chapter 5 provisions address the maintenance of buildings in compliance with the code as well as how additions, alterations, repairs and changes of occupancy need to be addressed from the standpoint of energy efficiency. Specific provisions are provided for historic buildings.

Chapter 6 Referenced Standards.

Chapters 6 [CE] and 6 [RE] list all of the product and installation standards and codes that are referenced throughout Chapters 1 through 5 and include identification of the promulgators and the section numbers in which the standards and codes are referenced. As stated in Sections C102.4 and R102.4, these standards and codes become an enforceable part of the code (to the prescribed extent of the reference) as if printed in the body of the code.

Appendices.

The appendices, while not part of the code, can become part of the code when specifically included in the adopting ordinance.

Chapter 1 requires the establishment of a board of appeals to hear appeals regarding determinations made by the code official.

Appendices CA and RA provide qualification standards for members of the board as well as operational procedures of such board.

Appendices CB, RB and RL address provisions for solar capacity in new structures.

Appendices CC and RC provide requirements intended bring about net zero annual energy consumption in their respective structures.

Appendix CD provides adopting jurisdictions a compliance path toward zero net energy construction by the 2030 adoption cycle.

Appendix CE provides a stretch code through HVAC incentives to Section C403.

Appendix CF provides advanced energy credit package requirements to improve efficiency requirements in Section C406.

Appendices CJ and RD provide requirements for electric energy storage readiness provisions.

Appendix CK provides jurisdictions the option to require mandatory on-site renewable energy in commercial buildings.

The purpose of Appendix RF is to provide expanded *R*-value options for determining compliance with the *U*-factor criteria in Section R402.

Similar to Appendix CD, Appendix RG provides requirements for residential buildings intended to lower energy consumption beyond the requirements of the 2024 IECC.

Appendix RH provides a means to evaluate a building's greenhouse gas performance in accordance with ANSI/RESNET/ICC 301.

Appendix RI describes requirements for prescriptive solar PV to be installed at the time of construction.

RELOCATION OF TEXT OR TABLES

The following tables indicate the relocation of sections and tables in the 2024 edition of the IECC from the 2021 edition.

IECC [CE] RELOCATIONS	
2024 LOCATION	**2021 LOCATION**
C101.4	C101.5
C101.4.1	C101.5.1
C102.1	C101.4
C102.1.1	C101.4.1
C102.2	C108.3
C102.3	C108.2
C102.4	C108.1
C102.4.1	C108.1.1
C102.4.2	C108.1.2
C102.5	C107.1
C104	C102
C104.1	C102.1
C104.1.1	C102.1.1
C105	C103
C105.1	C103.1
C105.2	C103.2
C105.2.1	C103.2.1
C105.3	C103.3
C105.3.1	C103.3.1
C105.3.2	C103.3.2
C105.3.3	C103.3
C105.4	C103.4
C105.5	C103.5
C105.6	C103.6
C105.6.1	C103.6.1
C105.6.2	C103.6.2
C105.6.3	C103.6.3
C106	C104
C106.1	C104.1
C106.2	C104.2
C106.4	C104.3
C106.5	C104.4
C106.6	C104.5
C107	C105
C107.1	C105.1
C107.2	C105.2
C107.2.1	C105.2.1
C107.2.2	C105.2.2
C107.2.3	C105.2.3
C107.2.4	C105.2.4
C107.2.5	C105.2.5
C107.2.6	C105.2.6

IECC [CE] RELOCATIONS—continued	
2024 LOCATION	**2021 LOCATION**
C107.3	C105.3
C107.4	C105.4
C107.5	C105.5
C107.6	C105.6
C108	C106
C108.1	C106.1
C108.2	C106.2
C109	C110
C109.1	C110.1
C109.2	C110.2
C109.3	C110.3
C110	C109
C110.1	C109.1
C110.2	C109.2
C110.3	C109.3
C110.4	C109.4
C402.1.1.2	C402.1.1.1
Table C402.1.1.2	Table C402.1.1.1
C402.1.1.3	C402.1.2
C402.1.2	C402.1.4
Table C402.1.2	Table C402.1.4
C402.1.2.1.1	C402.1.4.1.1
C402.1.2.1.2	C402.1.4.1.2
C402.1.2.1.6	C402.1.4.2
C402.1.3.3	C402.2.1.3
C402.1.4	C402.1.5
C402.1.5	C402.5.5
C402.2.1.1	C402.2.1.4
C402.2.1.2	C402.2.1.5
C402.2.4	C402.2.4.1
C402.4	C402.3
Table C402.4	Table C402.3
C402.4.1	C402.3.1
C402.5	C402.4
Table C402.5	Table C402.4
C402.5.1	C402.4.1
C402.5.1.1	C402.4.1.1
C402.5.1.2	C402.4.1.2
C402.5.2	C402.4.2
C402.5.2.1	C402.4.2.1
C402.5.2.2	C402.4.2.2
C402.5.3	C402.4.3

IECC [CE] RELOCATIONS—continued	
2024 LOCATION	**2021 LOCATION**
C402.5.3.1	C402.4.3.1
C402.5.3.2	C402.4.3.2
C402.5.3.3	C402.4.3.3
C402.5.3.4	C402.4.3.4
C402.5.4	C402.4.4
C402.5.5	C402.4.5
C402.5.5.1	C402.4.5.1
C402.5.5.2	C402.4.5.2
C402.6	C402.5
C402.6.1	C402.5.1
C402.6.1.2	C402.5.1.1
C402.6.1.2.1	C402.5.10
C402.6.2	C402.5.1.2
C402.6.2.1	C402.5.3
C402.6.2.2	C402.5.2
C402.6.2.3	C402.5.1.5
C402.6.2.3.1	C402.5.1.3
C402.6.2.3.2	C402.5.1.4
C402.6.3	C402.5.4
Table C402.6.3	Table C402.5.4
C402.6.4	C402.5.6
C402.6.5	C402.5.7
C402.6.6	C402.5.9
C402.6.7	C402.5.8
C403.3.4.2	C403.3.4
Table C403.3.4.2	Table C403.3.4
C403.4.1.4	C403.4.1.3
C403.4.1.5	C403.4.1.4
C403.4.1.6	C403.4.1.5
C403.4.7	C402.6.11
C403.11	C403.10
C403.11.1	C403.10.1
C403.11.2	C403.10.2
C403.11.3	C403.10.3
C403.11.4	C403.10.4
C403.11.5	C403.10.5
C403.11.6	C403.10.6
C403.12	C403.11
C403.12.1	C403.11.1
Table C403.12.1	Table C403.11.1

IECC [CE] RELOCATIONS—continued	
2024 LOCATION	**2021 LOCATION**
C403.12.2	C403.11.2
C403.12.2.1	C403.11.2.1
Table C403.12.2.1(1)	Table C403.11.2.1(1)
Table C403.12.2.1(2)	Table C403.11.2.1(2)
Table C403.12.2.1(3)	Table C403.11.2.1(3)
C403.12.3	C403.11.3
C403.12.3.1	C403.11.3.1
C403.12.3.2	C403.11.3.2
C403.13	C403.12
C403.13.1	C403.12.1
C403.13.2	C403.12.2
C403.13.2.1	C403.12.2.1
C403.13.2.2	C403.12.2.2
C403.13.2.3	C403.12.2.3
C403.13.3	C403.12.3
Table C403.13.3(1)	Table C403.12.3
C403.13.3.1	C403.12.3.1
C403.14	C403.13
C403.14.1	C403.13.1
C403.14.2	C403.13.2
C403.14.4	C403.13.3
C405.2.9	C405.2.8
C405.10	C405.9
C405.10.1	C405.9.1
C405.10.2	C405.9.2
C405.10.2.1	C405.9.2.1
C405.11	C405.10
C405.13	C405.12
C405.13.1	C405.12.1
C405.13.2	C405.12.2
Table C405.13.2	Table C405.12.2
C405.13.3	C405.12.3
C405.13.4	C405.12.4
C405.13.5	C405.12.5

IECC [RE] RELOCATIONS	
2024 LOCATION	**2021 LOCATION**
R101.4	R101.5
R101.4.1	R101.5.1
R102.1	R101.4
R102.1.1	R101.4.1
R102.2	R108.3
R102.3	R108.2
R102.4	R108.1
R102.4.1	R108.1.1
R102.4.2	R108.1.2
R102.5	R107.1
R104	R102
R104.1	R102.1
R104.1.1	R102.1.1
R105	R103
R105.1	R103.1
R105.2	R103.2
R105.2.1	R103.2.1
R105.3	R103.3
R105.3.1	R103.3.1
R105.3.2	R103.3.2
R105.3.3	R103.3.3
R105.4	R103.4
R105.5	R103.5
R106	R104
R106.1	R104.1
R106.2	R104.2
R106.4	R104.3
R106.5	R104.4
R106.6	R104.5
R107	R105
R107.1	R105.1
R107.2	R105.2
R107.2.1	R105.2.1
R107.2.2	R105.2.2
R107.2.3	R105.2.3
R107.2.4	R105.2.4
R107.2.7	R105.2.5
R107.3	R105.3
R107.4	R105.4
R107.5	R105.5
R107.6	R105.6
R108	R106

IECC [RE] RELOCATIONS—continued	
2024 LOCATION	**2021 LOCATION**
R108.1	R106.1
R108.2	R106.2
R109	R110
R109.1	R110.1
R109.2	R110.2
R109.3	R110.3
R109.4	R110.4
R110	R109
R110.1	R109.1
R110.2	R109.2
R110.3	R109.3
R110.4	R109.4
R402.1.6	R402.4.4
R402.2.4	R402.2.3
R402.2.5	R402.2.4
R402.2.5.1	R402.2.4.1
R402.2.6	R402.2.5
R402.2.7	R402.2.6
R402.2.8	R402.2.7
R402.2.9	R402.2.8
R402.2.9.1	R402.2.8.1
R402.2.10	R402.2.9
R402.2.10.1	R402.2.9.1
R402.2.11	R402.2.10
R402.2.11.1	R402.2.10.1
R402.2.12	R402.2.11
R402.2.13	R402.2.12
R402.4	R402.3
R402.4.1	R402.3.1
R402.4.2	R402.3.2
R402.4.3	R402.3.3
R402.4.4	R402.3.4
R402.4.5	R402.3.5
R402.5	R402.4
R402.5.1	R402.4.1
R402.5.1.1	R402.4.1.1
Table R402.5.1.1	Table R402.4.1.1
R402.5.1.2	R402.4.1.2
R402.5.1.3	R402.4.1.3
R402.5.2	R402.4.2
R402.5.3	R402.4.3
R402.5.4	R402.4.5
R402.5.5	R402.4.6

IECC [RE] RELOCATIONS—continued	
2024 LOCATION	**2021 LOCATION**
R402.6	R402.5
R403.3.2	R403.3.7
R403.3.3	R403.3.1
R403.3.4	R403.3.2
R403.3.5	R403.3.3
R403.3.5.1	R403.3.3.1
R403.3.6	R403.3.4
R403.3.6.1	R403.3.4.1
R403.3.7	R403.3.5
R403.3.8	R403.3.6
R403.9.2	R403.9
R404.1.5	R404.1.2
R405.4.3	R405.5.3
R405.5.4	R405.3.2
R405.5.4.1	R405.3.2.1
R405.5.4.2	R405.3.2.2
R406.3	R406.3.1
R501.4	R501.5
R501.5	R501.6
R502.2	R502.3
R502.2.1	R502.3.1
R502.2.2	R502.3.2
R502.2.3	R502.3.3
R502.2.4	R502.3.4

ABBREVIATIONS AND NOTATIONS

The following table contains a list of common abbreviations and units of measurement used in this code. Some of the abbreviations are for terms defined in Chapter 2. Others are terms used in various tables and text of the code.

ABBREVIATIONS AND NOTATIONS	
AFUE	Annual fuel utilization efficiency
bhp	Brake horsepower (fans)
Btu	British thermal unit
Btu/h × ft^2	Btu per hour per square foot
C-factor	See Chapter 2—Definitions
CDD	Cooling degree days
cfm	Cubic feet per minute
cfm/ft^2	Cubic feet per minute per square foot
ci	Continuous insulation
COP	Coefficient of performance
DCV	Demand control ventilation
°C	Degrees Celsius
°F	Degrees Fahrenheit

ABBREVIATIONS AND NOTATIONS—continued	
DWHR	Drain water heat recovery
DX	Direct expansion
E_c	Combustion efficiency
E_v	Ventilation efficiency
E_t	Thermal efficiency
EER	Energy efficiency ratio
EF	Energy factor
ERI	Energy rating index
F-factor	See Chapter 2—Definitions
FDD	Fault detection and diagnostics
FEI	Fan energy index
FL	Full load
ft^2	Square foot
gpm	Gallons per minute
HDD	Heating degree days
hp	Horsepower
HSPF	Heating seasonal performance factor
HVAC	Heating, ventilating and air conditioning
IEER	Integrated energy efficiency ratio
IPLV	Integrated Part Load Value
Kg/m^2	Kilograms per square meter
kW	Kilowatt
LPD	Light power density (lighting power allowance)
L/s	Liters per second
Ls	Liner system
m^2	Square meters
MERV	Minimum efficiency reporting value
NAECA	National Appliance Energy Conservation Act
NPLV	Nonstandard Part Load Value
Pa	Pascal
PF	Projection factor
pcf	Pounds per cubic foot
psf	Pounds per square foot
PTAC	Packaged terminal air conditioner
PTHP	Packaged terminal heat pump
R-value	See Chapter 2—Definitions
SCOP	Sensible coefficient of performance
SEER	Seasonal energy efficiency ratio
SHGC	Solar Heat Gain Coefficient
SPVAC	Single packaged vertical air conditioner
SPVHP	Single packaged vertical heat pump
SRI	Solar reflectance index
SWF	Service water heat recovery factor
U-factor	See Chapter 2—Definitions

ABBREVIATIONS AND NOTATIONS—continued	
VAV	Variable air volume
VRF	Variable refrigerant flow
VT	Visible transmittance
W	Watts
w.c.	Water column
w.g.	Water gauge

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IECC—COMMERCIAL PROVISIONS

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