



SIGNIFICANT CHANGES TO THE

INTERNATIONAL ENERGY CONSERVATION CODE[®]

2021 EDITION

**SIGNIFICANT CHANGES TO THE
International Energy Conservation Code®**

2021 EDITION

International Code Council

ICC Staff:

Executive Vice President and Director of
Business Development:

Mark A. Johnson

Senior Vice President, Business and
Product Development:

Hamid Naderi

Vice President and Technical Director,
Products and Services:

Doug Thornburg

Senior Marketing Specialist:

Dianna Hallmark

ISBN: 978-1-952468-22-3 (print)

ISBN: 978-1-955052-47-4 (PDF download)

Project Head: Doug Thornburg

Publications Manager: Anne F. Kerr

Cover Design: Ricky Razo



COPYRIGHT © 2021

by INTERNATIONAL CODE COUNCIL, INC.

ALL RIGHTS RESERVED.

This publication is a copyrighted work owned by the International Code Council, Inc. (ICC). Without advance written permission from the ICC, no part of this publication may be reproduced, distributed or transmitted in any form or by any means, including, without limitation, electronic, optical or mechanical means (by way of example, and not limitation, photocopying or recording by or in an information storage retrieval system). For information on use rights and permissions, please contact: ICC Publications, 4051 Flossmoor Road, Country Club Hills, IL 60478; phone: 1-888-ICC-SAFE (422-7233).

The information contained in this document is believed to be accurate; however, it is being provided for informational purposes only and is intended for use only as a guide. Publication of this document by the ICC should not be construed as the ICC engaging in or rendering engineering, legal or other professional services. Use of the information contained in this book should not be considered by the user to be a substitute for the advice of a registered professional engineer, attorney or other professional. If such advice is required, it should be sought through the services of a registered professional engineer, licensed attorney or other professional.

Trademarks: "International Code Council," the "International Code Council" logo, "ICC," the "ICC" logo, "International Energy Conservation Code," "IECC," "International Residential Code," "IRC," "International Fire Code," "IFC," "International Existing Building Code," "IEBC" and other names and trademarks appearing in this book are registered trademarks of the International Code Council, Inc., and/or its licensors (as applicable), and may not be used without permission.

Errata on various ICC publications may be available at www.iccsafe.org/errata.

First Printing: September 2021

PRINTED IN THE USA

Contents



PART 1

Commercial Energy Provisions: Administration Chapters 1 and 2

- **C103.1**
Digital Plans C-2
- **C103.2**
Information on Construction Documents C-3
- **C202**
Definition of Biogas and Biomass C-5
- **C202**
Definitions of Fan Efficiencies C-7

PART 2

Commercial Energy Provisions: General Requirements Chapter 3

- **C301.3**
Climate Zone Definitions C-9

PART 3

Commercial Energy Provisions: Energy Efficiency Requirements Chapters 4 and 5

- **C401.2**
Compliance Paths C-21

- **C401.3**
Envelope Certificate C-23
- **C402**
Building Envelope C-25
- **Table C402.1.3**
Minimum *R*-Values C-26
- **Table C402.1.4**
Insulation and Fenestration
U-Factor Criteria C-28
- **C402.1.4.1 and C402.2.1**
Roof Assembly and Insulation C-31
- **Table C402.4**
U-Factor and SHGC Requirements C-33
- **C402.5**
Air Leakage C-35
- **C402.5.11**
Operable Openings Interlocking C-40
- **C403**
Building Mechanical Systems C-42
- **C403.4.2.3**
Automatic Start and Stop C-44
- **C403.8.3**
Fan Efficiency C-45
- **C403.8.5**
Low-Capacity Ventilation Fans C-47

■ C405	Electrical Power and Lighting Systems	C-49	■ R202	Definition of High-Efficacy Light Sources	R-5
■ C405.2.1.2	Occupant Sensor Controls in Warehouse Storage Areas	C-50	■ R202	Definition of Renewable Energy Certificate	R-6
■ C405.2.8	Parking Garage Lighting Control	C-52	PART 6		
■ C405.4	Lighting for Plant Growth	C-54	Residential Energy Provisions:		
■ C405.11	Automatic Receptacle Control	C-55	General Requirements		
■ C405.12	Energy Monitoring	C-57	Chapter 3		
■ C406	Additional Efficiency Requirements	C-60	■ R301.3	Climate Zone Definitions	R-8
■ C407	Total Building Performance	C-75	PART 7		
■ C407.2	Performance-Based Compliance	C-76	Residential Energy Provisions:		
PART 4			Energy Efficiency Requirements		
Commercial Energy Provisions:			Chapters 4 and 5		
Commercial Appendices			R-18		
■ Appendix CA	Board of Appeals – Commercial	C-79	■ R401.2	Compliance Paths	R-20
■ CB103.7	Electrical Energy Storage System-Ready Area	C-82	■ R401.3	Certificate	R-23
■ Appendix CC	Zero Energy Commercial Building Provisions	C-84	■ R402	Building Envelope	R-25
PART 5			■ R402.1.2	Insulation and Fenestration Criteria	R-26
Residential Energy Provisions:			■ Table R402.1.2	Insulation and Fenestration <i>U</i> -Factors	R-27
Administration			■ Table R402.1.3	Insulation Minimum <i>R</i> -Values and Fenestration Requirements by Component	R-29
Chapters 1 and 2			■ R402.2.8	Basement Walls	R-32
■ R103.1	Digital Plans	R-2	■ R402.4.1.2	Air Leakage Testing	R-34
■ R103.2	Information on Construction Documents	R-3	■ R402.5	Maximum Fenestration <i>U</i> -factor and SHGC	R-37
			■ R403	Systems	R-38
			■ R403.3.1-R403.3.3.1	Duct Location and Insulation	R-39
			■ R403.3.5	Duct Testing	R-42

■ R403.6.3 Mechanical Ventilation System Testing	R-44	■ R406.3 Building Thermal Envelope	R-60
■ R404 Electrical Power and Lighting Systems	R-46	■ R406.7.3 Renewable Energy Certificate Documentation	R-61
■ R404.1.1 Exterior Lighting	R-47	■ R407 Tropical Climate Region	R-62
■ R404.2 Interior Lighting Controls	R-48	■ R408 Additional Efficiency Package Options	R-64
■ R404.3 Exterior Lighting Controls	R-49		
■ R405 Total Building Performance	R-50	PART 8 Residential Energy Provisions: Residential Appendices	R-67
■ R405.2 Performance-Based Compliance	R-51	■ Appendix RA Board of Appeals–Residential	R-68
■ R405.3.2 Compliance Report	R-54	■ RB103.5 Shading	R-72
■ R406 Energy Rating Index Compliance Alternative	R-57	■ Appendix RC Zero Energy Residential Building Provisions	R-74
■ R406.2 ERI Compliance	R-58		

Preface

The purpose of *Significant Changes to the International Energy Conservation Code®*, 2021 Edition is to familiarize building officials, plans examiners, inspectors, design professionals, contractors and others in the construction industry with many of the important changes in the 2021 *International Energy Conservation Code®* (IECC®). This publication is designed to assist those code users in identifying the specific code changes that have occurred and, more importantly, understanding the reasons behind the changes. It is also a valuable resource for jurisdictions in their code-adoption process.

Only a portion of the total number of code changes to the IECC are discussed in this book. The changes selected were identified for a number of reasons, including the frequency of application, special significance or change in application. However, the importance of those changes not included is not to be diminished. Further information on all code changes can be found in the *Complete Revision History to the 2021 I-Codes*, available from the International Code Council® (ICC®) online store. The revision history provides the published documentation for each successful code change contained in the 2021 IECC since the 2018 edition.

The IECC discussion in this publication addressing significant code changes is arranged to follow the general layout of the IECC, including code sections and section number format. The table of contents, in addition to providing guidance in the use of this publication, allows for the quick identification of the significant code changes that occur in the IECC.

Throughout the book, each change is accompanied by a photograph, an application example or an illustration to assist and enhance the reader's understanding of the specific change. A summary and a discussion of the significance of the changes are also provided. Each code change is identified by type, either an addition, modification, clarification or deletion.

The code change itself is presented in a format similar to the style utilized for code-change proposals. Deleted code language is shown with a strike-through, and new code text is indicated by underlining. As a result, the actual 2021 code language is provided as well as a comparison with the 2018 code language so the user can easily determine changes to the specific code text.

As with any code-change text, *Significant Changes to the International Energy Conservation Code, 2021 Edition* is best used as a study companion to the 2021 IECC. Because only a limited discussion of each change is provided, the code itself should always be referenced to gain a more comprehensive understanding of the code change and its application.

The commentary and opinions set forth in this text are those of the authors and do not necessarily represent the official position of the ICC. In addition, they may not represent the views of any enforcing agency, as such agencies have the sole authority to render interpretations of the IECC. In many cases, the explanatory material is derived from the reasoning expressed by the code-change proponent.

Comments concerning this publication are encouraged and may be directed to the ICC at significantchanges@iccsafe.org.

About the *International Energy Conservation Code*

The IECC is a comprehensive model code that regulates minimum energy-efficient provisions for new buildings and additions and alterations to existing buildings. The IECC contains two separate sets of provisions – commercial and residential. These provisions apply to the building thermal envelope and mechanical, service water heating and electrical power and lighting systems of applicable building types. Administrative provisions and definitions specific to each set of requirements are also included. The IECC integrates easy-to-understand prescriptive provisions for compliance as well as performance criteria that make possible the use of new and innovative materials, equipment and building designs.

The IECC is one of many codes in the family of International Codes published by the International Code Council (ICC). These codes are maintained and updated through an open code development process. Building officials, design professionals and others involved in the building construction industry recognize the need for a modern, up-to-date energy code addressing the design and installation of building systems through requirements emphasizing energy efficiency. The IECC, in the 2021 edition, is intended to meet these needs through model code regulations for energy efficient buildings in all communities, large and small.

The ICC was established in 1994 and is a nonprofit association that provides a wide range of building safety solutions including product evaluation, accreditation, certification, codification and training. The ICC develops model codes and standards used worldwide to construct safe, sustainable, affordable and resilient structures. The ICC's mission is to provide the highest-quality codes, standards, products and services for all concerned with the safety and performance of the built environment.

About the Authors

Michelle L. Britt, LEED AP
Partner, Britt/Makela Group

Michelle L. Britt was the Director of Energy Programs for the ICC from late 2017 through 2020. Prior to employment with ICC she spent 9 years as a partner with Britt/Makela Group as an energy consultant focused on energy codes, beyond code programs and energy efficiency domestically and in the Pacific Islands. Ms. Britt also spent 4 years with Pacific Northwest National Laboratory in the Building Energy Codes Program where she focused on deployment of the energy code and development of appliance standards. She has had the opportunity to work in the U.S. Territories of Guam, the Commonwealth of the Mariana Islands and American Samoa, Fiji, India and Saudi Arabia. Ms. Britt began her career as a planner with the town of Tiburon in California.

In her role with ICC, Ms. Britt was Secretariat for the IECC code development process and staff liaison to the Sustainability, Energy and High Performance Code Action Committee. She led ICC initiatives focused on IECC compliance, advanced energy efficiency and decarbonization, and supported energy efficiency internationally.

A graduate of Sonoma State University and the University of Idaho, Ms. Britt has 30 years of experience in the built environment. She has authored a wide variety of other code and beyond code support publications including *Evaluating Energy Code Compliance in Cities – Guidance and Methodology*, *Building America Best Practices Series Volume 13: Energy Performance Techniques and Technologies: Preserving Historic Homes* and *Going Beyond Code: A Guide to Creating Effective Green Building Programs for Energy Efficient and Sustainable Communities*.

Jerica Stacey
Energy Code Specialist, International Code Council

Jerica Stacey has over a decade of experience in the development, adoption and implementation of building energy codes and standards, as well as with energy code compliance evaluations and field studies and energy efficiency program evaluations. Ms. Stacey has worked in both the public and private sectors, supporting the energy codes and standards practice area at Cadmus, working as an energy code consultant with the Britt/Makela Group and contributing to projects under the U.S. Department of Energy's Building Energy Codes Program while at the Pacific Northwest National Laboratory. Ms. Stacey is currently an energy code specialist supporting ICC's Business and Product Development group.

Ms. Stacey has authored a wide variety of energy code support publications and studies, including the 2021 *Energy Code Essentials*; 2018 *CARICOM Energy Code Essentials*; *Attributing Codes and Standards Savings to Program Administrator Activities: Review of Approaches in Canada and the United States*; *Giving Credit Where Credit Is Due: Assessing Attribution and Savings from a Building Energy Code Compliance Enhancement Program*; *Compliance Verification Paths for Residential and Commercial Energy Codes*; and numerous impact and process evaluations for utilities, state government offices and program administrators.

About the International Code Council®

The International Code Council is a nonprofit association that provides a wide range of building safety solutions including product evaluation, accreditation, certification, codification and training. It develops model codes and standards used worldwide to construct safe, sustainable, affordable and resilient structures. ICC Evaluation Service (ICC-ES) is the industry leader in performing technical evaluations for code compliance, fostering safe and sustainable design and construction.

Washington DC Headquarters:
 500 New Jersey Avenue, NW, 6th Floor
 Washington, DC 20001

Regional Offices:
 Eastern Regional Office: (BIR)
 Central Regional Office: (CH)
 Western Regional Office: (LA)

Distribution Center (Lenexa, KS)
 1-888-ICC-SAFE (1-888-422-7233)
www.iccsafe.org

Family of Solutions:



