

2 0 1 8

INTERNATIONAL CODES®

2018 I-CODE BONUS OFFER

Get a **free 45-day online subscription** to ICC's *premiumACCESS*™ 2018 I-Codes Complete Collection. Test drive many powerful, time-saving tools available to you from *premiumACCESS*. To activate your bonus, visit www.iccsafe.org/codebonus.

IgCC®

A Member of the International Code Family®

POWERED BY

ANSI/ASHRAE/ICC/USGBC/IES 189.1-2017
Standard for the Design of High-Performance
Green Buildings Except Low-Rise Residential Buildings



INTERNATIONAL GREEN CONSTRUCTION CODE®

A Comprehensive Solution for High-Performance Buildings



The American
Institute
of Architects



2018 International Green Construction Code®

First Printing: September 2018

ISBN: 978-1-60983-756-3

COPYRIGHT © 2018
by
INTERNATIONAL CODE COUNCIL, INC.
and
ASHRAE

ALL RIGHTS RESERVED. This 2018 *International Green Construction Code*® is a copyrighted work owned by the International Code Council, Inc. (ICC) and ASHRAE. Without advance written permission from the ICC or ASHRAE, no part of this book 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).

Trademarks: “International Code Council,” the “International Code Council” logo, “ICC,” the “ICC” logo, “International Green Construction Code,” the “IgCC” 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. “ASHRAE” and the “ASHRAE” logo are registered trademarks of American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. and may not be used without permission.

PRINTED IN THE USA

PREFACE

Introduction

Internationally, code officials and designers recognize the need for a modern, up-to-date code governing the impact of buildings and structures on the environment. This code is designed to meet this need through model code regulations that contain clear and specific requirements with provisions that promote safe and sustainable construction in an integrated fashion with the ICC Family of Codes. This 2018 *International Green Construction Code*® (IgCC®) is the first fully integrated edition of the IgCC to be developed cooperatively by ICC and ASHRAE. (See Foreword on page iv.)

This comprehensive green code establishes minimum regulations for building systems and site considerations using prescriptive and performance-related provisions. It is intended to be compatible with all of the International Codes® (I-Codes®) published by the International Code Council® (ICC®), including the *International Building Code*®, *International Energy Conservation Code*®, *International Existing Building Code*®, *International Fire Code*®, *International Fuel Gas Code*®, *International Mechanical Code*®, *International Code Council Performance Code*®, *International Plumbing Code*®, *International Private Sewage Disposal Code*®, *International Property Maintenance Code*®, *International Residential Code*®, *International Swimming Pool and Spa Code*®, *International Wildland-Urban Interface Code*® and *International Zoning Code*®.

This code has been developed in collaboration with the following Cooperating Sponsors: The American Institute of Architects (AIA); ASHRAE; the U.S. Green Building Council (USGBC); and the Illuminating Engineering Society (IES). ICC wishes to thank these Cooperating Sponsors for recognizing the need for the development of a comprehensive set of green regulations that are enforceable, usable and adoptable.

The I-Codes, including this *International Green Construction Code*, are used in a variety of ways in both the public and private sectors. Most industry professionals are familiar with the I-Codes as the basis of laws and regulations in communities across the U.S. and in other countries. However, the impact of the codes extends well beyond the regulatory arena, as they are used in a variety of non-regulatory settings, including:

- Voluntary compliance programs such as those promoting sustainability, energy efficiency and disaster resistance.
- The insurance industry, to estimate and manage risk, and as a tool in underwriting and rate decisions.
- Certification and credentialing of individuals involved in the fields of building design, construction and safety.
- Certification of building and construction-related products.
- U.S. federal agencies, to guide construction in an array of government-owned properties.
- Facilities management.
- “Best practices” benchmarks for designers and builders, including those who are engaged in projects in jurisdictions that do not have a formal regulatory system or a governmental enforcement mechanism.
- College, university and professional school textbooks and curricula.
- Reference works related to building design and construction.

In addition to the codes themselves, the code development process brings together building professionals on a regular basis. It provides an international forum for discussion and deliberation about building design, construction methods, safety, performance requirements, technological advances and innovative products.

This code is founded on principles intended to establish provisions consistent with the scope of a green construction code that adequately protects the public health, safety and welfare; provisions that do not unnecessarily increase construction costs; provisions that do not restrict the use of new materials, products, or methods of construction; and provisions that do not give preferential treatment to particular types or classes of materials, products or methods of construction. This is achieved by comprehensive provisions that are enforceable, useable and adoptable.

Foreward

The 2018 *International Green Construction Code* is the third edition of the IgCC. In 2015, ICC and ASHRAE partnered in the development of this new version of the IgCC sponsored by AIA, ASHRAE, ICC, IES and USGBC. The previous two editions (2012 and 2015) were developed utilizing ICC's Code Development Process as part of the ICC Family of Codes.

As part of the partnership with ASHRAE, the responsibility for code provisions is now split between the ICC and ASHRAE processes. ICC is responsible for Chapter 1, Scope and Administration. ICC coordinated the technical provisions developed by ASHRAE with the provisions in Chapter 1 of the 2015 IgCC. The remainder of the code is the technical content that is based on the provisions of the 2017 edition of ANSI/ASHRAE/ICC/USGBC Standard 189.1, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings* (Standard 189.1) developed using the American National Standards Institute (ANSI)-approved ASHRAE consensus process. The Standing Standards Project Committee 189.1 (SSPC) serves as the consensus body that developed the standard.

USER NOTE: The code is formatted utilizing ICC's code format for chapter and section number designations. However, in order to provide the requisite road map to the technical provisions of Standard 189.1, the Standard 189.1 section number is included in parentheses following the IgCC section number – e.g., "Section 101.2 (1.) Purpose." The IgCC section number is 101.2 and the corresponding section number/title in Standard 189.1 is "Section 1 Purpose." In some cases where the text of the IgCC is based on Standard 189.1, the text has been edited to be consistent with ICC's publication style guidelines.

Scope and Administration (ICC – Chapter 1)

As noted previously, the provisions in Chapter 1 are primarily based on Chapter 1 of the 2015 IgCC. The text of Section 101 has been coordinated and correlated with Standard 189.1 Sections 1, 2 and 4 entitled "Purpose," "Scope" and "Administration and Enforcement," respectively. Sections 102 – 109 are basically identical to those contained in the 2015 edition of the IgCC as there are no corresponding Standard 189 sections.

Technical Content (ASHRAE – Chapters 2 – end, including appendices)

The technical content of the code contains the provisions from Standard 189.1, which was originally published in 2009 through a collaborative effort involving ASHRAE, IES, and USGBC. In 2015, ICC was added as an additional cosponsor of the standard, which reflected a Memorandum of Understanding signed in 2014 by ASHRAE, AIA, ICC, IES, and USGBC to better align green building goals through Standard 189.1, the IgCC, and the LEED certification system. As part of that agreement, the 2017 edition of Standard 189.1 serves as the technical content of this code. Prior to this agreement, the 2012 and the 2015 versions of the IgCC included Standard 189.1 as a project compliance option.

Building projects, which are defined in Standard 189.1 (and now in the IgCC), including both the building and the site, result in significant energy and environmental impacts through their design, construction, and operation. The U.S. Green Building Council reports that buildings in the United States produce 40% of U.S. carbon dioxide emissions, are responsible for 41% of U.S. energy consumption, account for 14% of U.S. potable water consumption, and use 40% of raw materials in their construction and operation. In addition, building development frequently converts land from biologically diverse natural habitat that helps manage rainwater to impervious hardscape with reduced biodiversity. While buildings consume energy and have other environmental impacts, they

exist primarily to serve occupants who live, work, and otherwise use buildings. Buildings also contribute significantly to national economies. Based on a combination of research and practical experience, it is clear that buildings can provide these services with reduced energy use, greenhouse gas emissions, water use, construction waste, heat island and light pollution effects, and impacts on the atmosphere and other resources. Furthermore, a 2015 Economic Impact Study by the USGBC finds that the U.S. green building industry supports over 2 million jobs annually and results in a median state average economic contribution of \$934 million.

The far-reaching influence of buildings, and the benefits provided by high-performance green buildings, have led many organizations to pursue efforts to reduce their energy and environmental impacts. Based on ASHRAE's and the other cosponsors' ongoing responsibilities to support such actions, Standing Standard Project Committee (SSPC) 189.1 has contributed to building sustainability goals by updating Standard 189.1 in response to input from the building community, the public at large, and project committee members. Compliance with this code will further reduce energy and environmental impacts through high-performance building design, construction, and operation, while providing indoor environments that support the activities, health, and comfort of building occupants and contribute positively to local economics by providing high-quality jobs and conserving natural resources.

The project committee considers a variety of factors in developing the provisions of Standard 189.1, including published research, justification for proposals received from outside the committee, and ultimately the committee members' professional judgment. Cost-benefit assessment, while an important consideration, is not a necessary criterion for inclusion of any given requirement in Standard 189.1. However, the practicality and existing application of any new requirements are considered before they are included.

Standard 189.1, and now the IgCC, address site sustainability, water use efficiency, energy use efficiency, indoor environmental quality, materials and resources, and construction and plans for operation. The 2017 edition of Standard 189.1 reflects the approval of 75 separate addenda to the 2014 edition. Some highlights among these changes include the following:

- **General.** Clarified the purpose and scope; revised the purpose to add resilience and a statement of intent that the document be broadly adoptable.
- **Site.** Updated requirements for pedestrian walkways, allowable sites, prohibited development, neighborhood assets, public transit access, and electric vehicle charging infrastructure; added new requirements for vegetated roofs, bicycle paths, and construction waste management.
- **Water.** Made all of the water efficiency requirements mandatory, eliminating the performance option in Chapter 6; updated requirements for irrigation of plants; added new requirements for water-bottle filling stations, reverse osmosis, and water softeners when they are part of the building design, and for preplumbing of dual plumbing systems when reclaimed or other alternate water sources are expected to become available in the future.
- **Energy.** Updated requirements to reflect changes in ANSI/ASHRAE/IES Standard 90.1-2016, including reference to Climate Zone 0; updated lighting tables with improved efficiencies; updated equipment efficiency tables; revised envelope requirements (with associated revisions to an informative appendix); conversion of Energy Performance Option A to use the Performance Cost Index; and updated CO₂ emission factors for different energy sources; added new requirements for automated demand response and deleted Energy Performance Option B; added a new informative appendix with an energy compliance path that builds on the *International Energy Conservation Code* (IECC) instead of Standard 90.1.
- **IEQ.** Updated requirements for control of soil gas entry, material emissions, acoustical control, and daylighting; added new requirements for control of moisture associated with envelope infiltration and HVAC systems, venting of combustion products to the outdoors, IEQ surveys of building occupants, and glare control.
- **Materials and resources.** Revised the section title and scope; updated requirements for life-cycle assessment.
- **Construction and plans for operation.** Updated requirements for commissioning and envelope airtightness testing; added a new informative appendix with additional information on the commissioning process.

For Standard 189.1 and now this edition of the IgCC, all chapters other than Chapters 5, 6, and 10 use the following format:

xxx.1 General. This subsection includes a statement of scope and addresses other broad issues for the section.

xxx.2 Compliance Paths. This subsection indicates the compliance options available within a given section.

xxx.3 Mandatory Provisions. This subsection contains mandatory provisions that apply to all projects (i.e., provisions that must be met and may not be ignored in favor of provisions found in other subsections).

xxx.4 Prescriptive Option. This subsection, an alternative to the Performance Option, contains prescribed provisions that must be met in addition to all mandatory provisions. Prescribed provisions offer a simple compliance approach that involves minimal calculations.

xxx.5 Performance Option. This subsection, an alternative to the Prescriptive Option, contains performance-based provisions that must be met in addition to all mandatory provisions. Performance provisions offer a more complex alternate compliance approach that typically involves simulation or other calculations.

Maintenance

The maintenance responsibilities for updating the IgCC are shared between ICC and ASHRAE, as follows:

Scope and Administration (Chapter 1: ICC process)

Chapter 1 of the *International Green Construction Code* will be kept up to date through the review of proposed changes submitted by code enforcement officials, industry representatives, design professionals and other interested parties. Proposed changes are carefully considered through an open code development process in which all interested and affected parties may participate.

The ICC Code Development Process reflects principles of openness, transparency, balance, due process and consensus, the principles embodied in OMB Circular A-119, which governs the federal government's use of private-sector standards. The ICC process is open to anyone; there is no cost to participate, and people can participate without travel cost through the ICC's cloud-based app, *cdp-Access*®. A broad cross section of interests are represented in the ICC Code Development Process. The codes, which are updated regularly, include safeguards that allow for emergency action when required for health and safety reasons.

The 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 contents of this work are subject to change through the 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 International Code Council. The next opportunity to propose changes to Chapter 1 of the IgCC will be ICC's 2019 Group A Code Development Process. For more information, go to ICC's website at iccsafe.org.

Technical Content (Chapters 2 - end, including appendices: ASHRAE process)

The technical content of this code is based on Standard 189.1. SSPC 189.1 considers and administers changes to Standard 189.1 as a continuous maintenance standard and provides interpretations as requested. Proposed changes to the standard may originate within or outside of the committee. The committee welcomes proposals for improving the standard using the ANSI-approved ASHRAE continuous maintenance procedure. A continuous maintenance proposal (CMP) form can be found online at <https://www.ashrae.org/technical-resources/standards-and-guidelines/standards-and-guidelines-under-continuous-maintenance>, and may be completed and submitted at any time. The committee takes formal action on every proposal received, which may lead to changes to the published standard. ASHRAE posts approved addenda in publication notices on the ASHRAE website. To receive notice of all public reviews, approved and published addenda, errata, and interpretations as well as meeting notices, ASHRAE encourages interested parties to sign up for the

free ASHRAE Internet Listserv for Standard 189.1. (<https://www.ashrae.org/technical-resources/standards-and-guidelines/project-committee-list-servers>).

Coordination of the International Codes

The coordination of code provisions is one of the strengths of the ICC family of model codes. The codes can be used as a complete set of complementary documents, which will provide users with full integration and coordination of provisions. Individual codes can also be used in subsets or as stand-alone documents.

Italicized Terms

Words and terms that are defined in Chapter 3, Definitions, Abbreviations, and Acronyms are italicized where they appear in code text. Where such words and terms are not italicized, common-use definitions apply. The words and terms selected have code-specific definitions that the user should read carefully to facilitate better understanding of the code.

Adoption

All title in and copyright in this code belong to ICC and ASHRAE jointly. Maintaining copyright allows the ICC and ASHRAE to fund their respective missions through sales of books, in both print and electronic formats. The ICC welcomes adoption of its codes by jurisdictions that recognize and acknowledge the ICC's copyright in the code, and further acknowledge the substantial shared value of the public/private partnership for code development between jurisdictions and the ICC.

The ICC also recognizes the need for jurisdictions to make laws available to the public. All I-Codes and I-Standards, along with the laws of many jurisdictions, are available for free in a nondownloadable format on the ICC's website. Jurisdictions should contact the ICC at adoptions@iccsafe.org to learn how to adopt and distribute laws based on the *International Green Construction Code* in a manner that provides necessary access, while maintaining the ICC's copyright.

While the I-Code development procedure is thorough and comprehensive, the ICC, its members and those participating in the development of the codes disclaim any liability resulting from the publication or use of the I-Codes, or from compliance or noncompliance with their provisions. The ICC does not have the power or authority to police or enforce compliance with the contents of this code.

To facilitate adoption, sections of this code contain blanks for fill-in information that needs to be supplied by the adopting jurisdiction as part of the adoption legislation. For this code, please see:

Section 101.1. Insert: [NAME OF JURISDICTION]

Effective Use of the International Green Construction Code

Informative Note: Corresponding ASHRAE 189.1 section numbers have not been included in this Effective Use section but have been included throughout the chapters and appendices of this code.

The *International Green Construction Code*® (IgCC®) is a model code that provides minimum requirements to safeguard the environment, public health, safety and general welfare through the establishment of requirements that are intended to reduce the negative impacts and increase the positive impacts of the built environment on the natural environment and building occupants. The IgCC is fully compatible with the ICC family of codes, including the *International Building Code*® (IBC®), the *International Code Council Performance Code*® (ICCPC®), the *International Energy Conservation Code*® (IECC®), the *International Existing Building Code*® (IEBC®), the *International Fire Code*® (IFC®), the *International Fuel Gas Code*® (IFGC®), the *International Mechanical Code*® (IMC®), the *International Plumbing Code*® (IPC®), the *International Private Sewage Disposal Code*® (IPSDC®), the *International Property Maintenance Code*® (IPMC®), the *International Residential Code*® (IRC®), the *International Swimming Pool and Spa Code*® (ISPSC®), the *International Wildland-Urban Interface Code*® (IWUIC®), and the *International Zoning Code*® (IZC®).

The IgCC addresses site sustainability, water and energy efficiency, indoor environmental quality, materials and resources, building commissioning, construction and plans for operations and maintenance for new and certain types of existing buildings, building sites and building materials, components, equipment and systems (see Section 101.3.1). The code will be promulgated on a 3-year cycle to allow for new construction methods and technologies to be incorporated into the code. Innovative approaches and alternative materials, designs, and methods not specifically addressed in this code can be approved by the code official where the proposed innovative approaches or materials, designs or methods comply with the intent of the provisions of the code (see Section 105.4).

The IgCC applies to all occupancies other than single-family dwellings and multifamily dwellings that are three stories or less in height (see Section 101.3.2). See discussion below for additional information in Appendix J for residential construction.

Arrangement and Format of the 2018 IgCC

Before applying the requirements of the IgCC, it is beneficial to understand its arrangement and format.

Chapter	Subjects
1	Scope and administration
2	Reserved
3	Definitions, abbreviations and acronyms
4	Reserved
5	Site sustainability
6	Water use efficiency
7	Energy efficiency
8	Indoor environmental quality (IEQ)
9	Materials and resources
10	Construction and plans for operation
11	Normative references
Normative Appendix A	Climate zones and prescriptive building envelope and duct insulation tables
Normative Appendix B	Prescriptive equipment efficiency tables for the alternate reduced renewables and increased equipment efficiency approach in Section 701.4.1.1.2 (7.4.1.1.2)
Normative Appendix C	Performance option for energy efficiency
Normative Appendix D	Building concentrations

Informative Appendix E	Building envelope tables
Informative Appendix F	Integrated design
Informative Appendix G	Informative references
Informative Appendix H	Option for energy efficiency using the IECC prescriptive compliance path
Informative Appendix I	Additional guidance for functional and performance testing (FPT) and the commissioning (Cx) process
Informative Appendix J	Option for residential compliance using the <i>National Green Building Standard</i>
Informative Appendix K	Addenda description information
Annex 1	Referenced standard reproduction annex—ASHRAE Standard 169

The following is a chapter-by-chapter synopsis of the scope and intent of the provisions of the *International Green Construction Code*:

Chapter 1 Scope and Administration. Chapter 1 of the IgCC establishes the limits of applicability of the code and describes the manner in which the code is to be applied and enforced. Chapter 1 is divided into two parts: Part 1 – Scope and Application (Sections 101 and 102); and Part 2 – Administration and Enforcement (Sections 103 – 109).

Section 101 identifies which buildings and structures come under its purview and Section 102 references other adopted I-Codes as applicable. Section 103 establishes the duties and powers of the code official, including enforcement and the authority granted to the code official to make inspections. Section 105 provides guidance to the code official in the approval of materials, methods of construction, designs, systems and innovative approaches where they are not specifically prescribed in the IgCC. Section 106 identifies the permitting process.

The provisions of Chapter 1 also establish the rights and privileges of the design professional, contractor and property owner.

The IgCC is intended to be adopted as a legally enforceable document and it cannot be effective without adequate provisions for its administration and enforcement.

Chapter 2 Reserved.

Chapter 3 Definitions, Abbreviations and Acronyms. All terms that are defined in the code are listed alphabetically in Chapter 3. Codes are technical documents and every word, term and punctuation mark can impact the meaning of the code text and the intended results. The code often uses terms that have a unique meaning in the code and that code meaning can differ substantially from the ordinarily understood meaning of the term as used outside of the code. Where a definition is provided for understanding a particular code provision, the term is shown in italics wherever it appears in the code. The generally understood meaning of a term or phrase might not be sufficient or consistent with the meaning prescribed by the code; therefore, it is essential that the code-defined meaning be known.

Definitions are deemed to be of prime importance in establishing the meaning and intent of the code text that uses code-defined terms. The user of the code should be familiar with and consult this chapter 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 in a manner that is not commonly understood.

Chapter 4 Reserved.

Chapter 5 Site Sustainability. Chapter 5 contains requirements related to the selection and development of sites and the mitigation of heat island effect, light pollution and transportation impact.

Section 501.3 limits the type of sites that can be built upon and the type of development that can occur.

Section 501.3.1.1 limits building sites to within the envelope of an existing building, brownfield sites, greyfield sites and certain limited types of greenfield sites.

Section 501.3.1.2 limits building development relative to elevation of the 100-year flood, near fish and wildlife habitat conservation areas and near wetlands.

Section 501.3.2 requires predesign site inventory and assessment.

Section 501.3.3 regulates plantings on the site.

Section 501.3.4 contains requirements for stormwater management systems.

Section 501.3.5 requires the mitigation of heat island effect.

Section 501.3.6 addresses light pollution.

Section 501.3.7 addresses transportation impacts.

Section 501.3.8.1 addresses building site waste management.

Chapter 6 Water Use Efficiency. Chapter 6 provides requirements that are intended to conserve potable and nonpotable water.

Section 601.3.1 reduces water use on sites by means of requirements related to landscape design and irrigation system design.

Section 601.3.2 regulates water consumption through limitations of fixture and fitting flow rates and by means of requirements related to specific equipment, appliances and HVAC systems and equipment.

Section 601.3.3 regulates water use in ornamental fountains and water features.

Section 601.3.4 requires water metering/monitoring and data collection.

Sections 601.3.5, 601.3.6 and 601.3.7 regulate water softeners, reverse osmosis water treatment systems and on-site reclaimed water treatment systems, respectively.

Where a reclaimed water supply is available or is planned to be available within 5 years, Section 601.3.8 requires the installation of a dual water supply plumbing system wherein reclaimed water is supplied to urinals and water closets.

Chapter 7 Energy Efficiency. Chapter 7 contains requirements related to the effective use of energy in buildings and appliances and to on-site renewable energy systems. Chapter 7 references ANSI/ASHRAE/IES Standard 90.1 and contains many provisions that exceed those in Standard 90.1. It should also be noted that Appendix H is an alternative prescriptive energy compliance path that is built on the prescriptive provisions of the *International Energy Conservation Code*.

Section 701.2 requires that building projects comply with the mandatory provisions of Section 701.3 and either the prescriptive provisions of Section 701.4 or the performance provisions of Section 701.5.

Section 701.3 contains mandatory provisions that are applicable to both the prescriptive and performance compliance paths. It includes provisions related to air barriers, on-site renewable energy systems, energy consumption management and automated demand response systems.

Section 701.4 contains the prescriptive-based energy compliance path. It includes provisions related to renewable energy systems, the building envelope, HVAC systems, service water heating, power, lighting and various other equipment.

Section 701.5 contains the performance-based energy compliance path. It is based on an annual energy cost concept that builds on Normative Appendix G of ANSI/ASHRAE/IES Standard 90.1. Compliance with Normative Appendix C of this code is also required for on-site renewable energy systems in the proposed design. Section 701.5.2 sets maximum annual carbon dioxide equivalent requirements.

Chapter 8 Indoor Environmental Quality (IEQ). Chapter 8 is intended to ensure that the building's interior environment is conducive to the health of building occupants.

Section 801.2 requires compliance with the mandatory provisions of Section 801.3 and either the prescriptive-based provisions of Section 801.4 or the performance-based provisions of Section 801.5.

Section 801.3 contains mandatory provisions related to indoor air quality, thermal environmental conditions, acoustical control, soil gas control, lighting quality, moisture control and glare control.

Section 801.4 contains prescriptive-based provisions related to indoor environmental quality. It includes requirements for daylighting, material volatile organic compound emissions and contents and lighting for presentations.

Section 801.5 contains performance-based provisions related to indoor environmental quality. It includes requirements for daylight simulation, material VOC emissions and lighting for presentations.

Chapter 9 Materials and Resources. Chapter 9 addresses the human health and environmental impacts of materials.

Section 901.2 requires that buildings comply with the mandatory provisions of Section 901.3 and either the prescriptive-based provisions of Section 901.4 or the performance-based provisions of Section 901.5.

Section 901.3 contains mandatory provisions related to the human health and environmental impacts of materials. It includes requirements for construction waste management; the extracting, harvesting and manufacturing of materials; refrigerants; the storage and collection of recyclables and discarded goods and the mercury content levels of lamps.

Section 901.4 contains prescriptive-based requirements related to the human health and environmental impacts of materials. It includes provisions for recycled and salvaged material content, regional materials, biobased products and multiple-attribute product declaration/certification.

Section 901.5 contains performance-based requirements related to the health and environmental impacts of materials. It includes provisions for life-cycle assessment that address performance metrics, procedures and reporting.

Chapter 10 Construction and Plans for Operation. Chapter 10 addresses building commissioning and functional and performance testing during construction and requires plans for the subsequent operation and maintenance of building projects.

Section 1001.3.1.1 regulates the functional and performance testing of building systems.

Section 1001.3.1.2 regulates the building commissioning process.

Section 1001.3.1.3 regulates the documentation of the commissioning process.

Section 1001.3.1.4 regulates erosion and sedimentation control during construction.

Section 1001.3.1.5 regulates indoor air quality during construction.

Section 1001.3.1.6 regulates moisture control during construction.

Section 1001.3.1.7 addresses pollution from the idling of construction vehicles during construction.

Section 1001.3.1.8 addresses contaminant entry into buildings during construction.

Section 1001.3.1.9 requires post-construction testing for radon in buildings.

Section 1001.3.1.10 requires construction waste management during construction.

Section 1001.3.2 requires plans for building project operation. These plans are intended to help and encourage building owners and facility management staff to operate and maintain building projects in a manner, and at a performance level, as was originally intended by this code.

Section 1001.3.2.3 requires that a service life plan be developed for the building project.

Section 1001.3.2.4 requires that a transportation management plan be developed.

Chapter 11 Normative References. The code contains numerous references to standards that are used to regulate materials and methods of construction. Chapter 11 contains a comprehensive list of all standards that are referenced in the code. The standards are part of the code to the extent of the reference to the standard (see Sections 102.4, 102.4.1 and 102.4.2). Compliance with the referenced standard is necessary for compliance with this code. By providing specifically adopted standards, the construction and installation requirements necessary for compliance with the code can be readily determined. The basis for code compliance is, therefore, established and available on an equal basis to the code official, contractor, designer and owner.

Chapter 11 is organized in a manner that makes it easy to locate specific standards. It lists all of the referenced standards, alphabetically, by acronym of the promulgating agency of the standard. Each agency's standards are then listed in either alphabetical or numeric order based on the standard identification. The list also contains the title of the standard; the edition (date) of the standard referenced; any addenda included as part of the ICC adoption of the IgCC; and the section or sections of this code that reference the standard.

Appendices. User note: Appendices in this edition of the IgCC are treated differently than the appendices in the other I-Codes (see Sections 101.4.3 and 101.4.4).

In the IgCC, the technical content is based on Standard 189.1, including the appendices. These appendices are identified in two categories:

- Normative appendices. As noted in Section 101.4.3, where a normative appendix is referenced in the code, it is considered part of the mandatory provisions of the code.
- Informative appendices. As noted in Section 101.4.4, these appendices provide additional information but are not mandatory provisions and therefore are not part of the code.

Normative Appendix A Climate Zones and Prescriptive Building Envelope and Duct Insulation Tables. This appendix is referenced in the definition of "climate zone" and Sections 701.4.2.1, 701.4.2.2 and 701.4.3.9. This appendix includes a mandatory reference to ANSI/ASHRAE Standard 169 to determine the applicable climate zone to be used in conjunction with Chapter 7 and includes minimum roof and duct insulation values.

Normative Appendix B Prescriptive Equipment Efficiency Tables for the Alternate Reduced Renewables and Increased Equipment Efficiency Approach in Section 701.4.1.1.2 (7.4.1.1.2). This appendix is referenced in Sections 701.4.1.1.2, 701.4.3.1, 701.4.4.1, 701.4.7.1 and 701.4.7.3.2. This appendix provides mandatory equipment efficiency information for the different types of mechanical equipment utilized for heating and cooling.

Normative Appendix C Performance Option for Energy Efficiency. This appendix is referenced in Section 701.5.1. This appendix provides a mandatory reference to ANSI/ASHRAE/IES Standard 90.1 for modeling requirements for on-site renewable energy systems and the required information to perform building performance calculations.

Normative Appendix D Building Concentrations. This appendix is referenced in Section 801.5.2. This appendix provides mandatory criteria to estimate building concentrations of materials for individual VOC concentrations.

Informative Appendix E Building Envelope Tables. As an informative appendix, this appendix is not referenced in the body of the code and is therefore not part of the code. This appendix provides R-values for common building assemblies such as roofs, walls, floors and doors. It also includes common fenestration values for glazed areas.

Informative Appendix F Integrated Design. As an informative appendix, this appendix is not referenced in the body of the code and is therefore not part of the code. This appendix provides details and concepts on the need for early collaboration in order to increase the predictability of project outcomes as early as possible in the design phase of the project. See Chapter 3 definition for "integrated design process."

Informative Appendix G Informative References. Even though this is an informative appendix, it is cited in Sections 101.4.2, 701.5.1 and 701.5.2, as well as Appendices B and C. However, as an informative appendix, it is not part of the code. This appendix includes potentially useful source documents that may be consulted.

Informative Appendix H Option for Energy Efficiency Using the IECC Prescriptive Compliance Path. As an informative appendix, this appendix is not referenced in the body of the code and is therefore not part of the code. This appendix provides an option for prescriptive energy compliance that is based on requirements in the *International Energy Conservation Code* (IECC). This approach allows the use of the prescriptive provisions of the IECC without directly relying on the energy provisions of ANSI/ASHRAE/IES Standard 90.1.

Appendix H includes provisions related to renewable energy systems, the building envelope, HVAC systems, service water heating, power, lighting and various other equipment.

Informative Appendix I Additional Guidance for Functional and Performance Testing (FPT) and the Commissioning (Cx) Process. As an informative appendix, this appendix is not referenced in the body of the code and is therefore not part of the code. This appendix provides guidance on best practices for performance testing and commissioning. See Chapter 3 definitions for “functional and performance testing (FPT)” and “commissioning (Cx) process.”

Informative Appendix J Option for Residential Compliance Using the National Green Building Standard. This appendix is cited in an informative note in Section 101.3. As an informative appendix, this appendix is not referenced in the body of the code and is therefore not part of the code. This appendix provides an option for residential compliance using the *National Green Building Standard*. The provisions in the appendix are mandatory only when specifically adopted. The provisions can be adopted in total or by individual section(s) at the discretion of the authority having jurisdiction.

Informative Appendix K Addenda Description Information. As an informative appendix, this appendix is not referenced in the body of the code and is therefore not part of the code. This appendix provides the roadmap of approved addenda to the 2014 edition of Standard 189.1 which resulted in the 2017 edition of Standard 189.1 which forms the technical content for this code. As can be seen by the list, there were 75 addenda to the 2014 edition.

Annex 1 Referenced Standard Reproduction Annex ASHRAE Standard 169. This annex contains pertinent information from ASHRAE Standard 169 for assessing climate zones. See also Normative Appendix A.

TABLE OF CONTENTS

CHAPTER 1 SCOPE AND ADMINISTRATION 1	NORMATIVE APPENDIX A
<i>PART 1—SCOPE AND APPLICATION 1</i>	CLIMATE ZONES AND
Section	PRESCRIPTIVE BUILDING
101 General 1	ENVELOPE AND DUCT
102 Applicability 2	INSULATION TABLES 93
<i>PART 2—ADMINISTRATION</i>	NORMATIVE APPENDIX B
<i>AND ENFORCEMENT 2</i>	PRESCRIPTIVE EQUIPMENT
103 Duties and Powers of the Authority	EFFICIENCY TABLES FOR THE
Having Jurisdiction 2	ALTERNATE REDUCED
104 Construction Documents 2	RENEWABLES AND INCREASED
105 Approval 2	EQUIPMENT EFFICIENCY
106 Permits 3	APPROACH IN SECTION
107 Inspections 3	701.4.1.1.2 (7.4.1.1.2) 97
108 Board of Appeals 4	NORMATIVE APPENDIX C
109 Certificate of Occupancy 4	PERFORMANCE OPTION FOR
CHAPTER 2 RESERVED 5	ENERGY EFFICIENCY 123
CHAPTER 3 DEFINITIONS, ABBREVIATIONS	NORMATIVE APPENDIX D
AND ACRONYMS 7	BUILDING CONCENTRATIONS . . 127
CHAPTER 4 RESERVED 15	INFORMATIVE APPENDIX E
CHAPTER 5 SITE SUSTAINABILITY 17	BUILDING ENVELOPE TABLES . . 129
CHAPTER 6 WATER USE EFFICIENCY 25	INFORMATIVE APPENDIX F
CHAPTER 7 ENERGY EFFICIENCY 31	INTEGRATED DESIGN 149
CHAPTER 8 INDOOR ENVIRONMENTAL	INFORMATIVE APPENDIX G
QUALITY (IEQ) 51	INFORMATIVE REFERENCES . . . 153
CHAPTER 9 MATERIALS AND RESOURCES 67	INFORMATIVE APPENDIX H
CHAPTER 10 CONSTRUCTION AND	OPTION FOR ENERGY
PLANS FOR OPERATION 71	EFFICIENCY USING THE IECC
CHAPTER 11 NORMATIVE REFERENCES 81	PRESCRIPTIVE COMPLIANCE
	PATH 159
	INFORMATIVE APPENDIX I
	ADDITIONAL GUIDANCE FOR
	FUNCTIONAL AND PERFORMANCE
	TESTING (FPT) AND THE
	COMMISSIONING (CX)
	PROCESS 163

TABLE OF CONTENTS

INFORMATIVE APPENDIX J
OPTION FOR RESIDENTIAL
COMPLIANCE USING THE
NATIONAL GREEN BUILDING
STANDARD..... 167

INFORMATIVE APPENDIX K
ADDENDA DESCRIPTION
INFORMATION..... 169

ANNEX 1
REFERENCED STANDARD
REPRODUCTION ANNEX ASHRAE
STANDARD 169 179