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THE CODES GUIDEBOOK FOR INTERIORS

» sixth edition

Sharon K. Harmon | Katherine E. Kennon

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**THE CODES
GUIDEBOOK FOR
INTERIORS**

THE CODES GUIDEBOOK FOR INTERIORS

Sixth Edition

Sharon Koomen Harmon
Katherine E. Kennon

WILEY

*This book is dedicated to the special men in my life: my husband,
James Kennon, Jr., and my sons Drake and Noel.*

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PREFACE

Codes and standards continue to change and evolve. Even federal regulations are amended and updated. Why does this seem like a never-ending process? Because the many organizations and individuals that develop the codes, standards, and federal regulations strive to make the built environment as safe as possible. We learn from recent events and apply this knowledge to our future buildings and spaces.

A wide variety of factors are taken into consideration. Recent building fires, natural disasters, and even acts of terrorism shed light on how building safety can be improved. Industry trends, such as new building products and improved technology, provide additional options for addressing building safety. Even the growing exchange of information worldwide has affected the concepts concerning building safety in recent years. For instance, performance codes were used in other countries before they were developed for use in the United States. In addition, we are already seeing sustainability and green practices incorporated into the codes, standards, and federal regulations—and at a much faster rate than originally anticipated. All of these influences continue to lead to new opportunities for collaboration between various organizations and future changes to the codes and standards. These ongoing changes challenge design professionals to stay up to date.

This book concentrates on the interior of a building because the codes, standards, and federal regulations affect projects on the interior of a building as much as the building shell. The goal is to make the codes user-friendly and to provide a good overall understanding of the various codes, standards, and federal regulations.

What sets this book apart is that it does more than just repeat the code requirements; it explains how various requirements and concepts work together to create building safety. This book considers the requirements from more than one specific code, and discusses the relationship of the various code publications and other related

documents and how to incorporate the different requirements into a single project. Understanding the overall code process creates safer buildings. It also makes code research more efficient, which can save both time and money. This sixth edition of *The Codes Guidebook for Interiors* includes the most recent changes and updates to the codes, standards, and federal regulations. The following previews what is included.

- Focuses on the most current and widely used building code, the 2012 *International Building Code (IBC)*, as well as other related International Code Council (ICC) codes, such as the 2012 *International Fire Code*.
- Discusses how to use the NFPA's 2012 *Life Safety Code (LSC)* in conjunction with the *IBC* regarding the various code topics presented, ranging from selecting occupancy classifications to determining means of egress and fire resistant assemblies.
- Incorporates information on the many standards referenced by the codes or used by the building and interior industry.
- Discusses the relationship of the ICC accessibility standard (2009 *ICC A117.1*) and the 2010 *ADA Standards* and how to use them in conjunction with the codes. The differences between the original 1991 *Americans with Disabilities Act Accessibility Guidelines (ADAAG)* and the new 2010 *ADA Standards* are also explained.
- Explains sustainability practices as they relate to the existing codes and newly developed green codes and standards, including the *International Green Construction Code (IGCC)* and the *ASHRAE/USGBC/IES 189.1, Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*.
- Describes the relationship between the energy codes, such as the 2012 *International Energy Conservation Code (IECC)*, sustainability codes, and federal energy regulations, and the *IBC*.
- Includes interior-related electrical code requirements based on the 2011 and 2014 *National Electrical Code (NEC)*.
- Explains plumbing codes (and plumbing fixtures), using the 2012 *International Plumbing Code*, and mechanical codes as they pertain to interior projects.
- Discusses the newest information on finish and furniture standards and testing, including the most current sustainability and life safety issues.

- Presents the role of alternative materials and methods and performance codes to allow creative options for meeting prescriptive code requirements.
- Explains the terms, concepts, and requirements of the codes, standards, and federal regulations in a simple, organized format—explaining the differences, which codes to use, and how to use them together.
- Includes multiple examples and sample floor plans covering a wide variety of building types and occupancy classifications.
- Includes many diagrams combining code and accessibility-related requirements for items such as means of egress, toilet and bathing rooms, and finish- and furniture-related items.
- Includes an updated checklist in each chapter.
- Includes the latest information on working with code officials and documenting your projects using prescriptive, performance, and/or sustainability codes.
- Addresses a variety of building and project types, both large and small, and includes information on existing buildings, historic buildings, and single-family homes.
- Supplementing the information in this book, a *Study Guide* is also available. It is a valuable resource to test your understanding of the terms, concepts, and requirements presented in the *Guidebook*.

I hope that this book is helpful to you.

Katherine E. Kennon, AIA

ACKNOWLEDGMENTS

This book was originally conceived and developed by Sharon K. Harmon as part of her personal education and development as an interior designer. She invited me to become part of this journey starting with the second edition. We have been partners in this endeavor through the subsequent revisions and editions. Although for this sixth edition she officially handed me the torch to carry on this work, she continued to help me with the parts of the process that she had mastered to make this task and this edition possible. I appreciate her trust and her assistance.

In order for the book to continue to be relevant and accurate, having industry professionals give perspective on the content is essential. I luckily found people willing to take the time to read, comment and suggest on sections and chapters within their professional purview. I want to thank Kim Shinn (sustainability), Steve Kemp (various engineering disciplines), Richard Graham (electrical) and Scott Lunsford (communication) for their contribution to the content of this edition.

I want to thank the International Code Council (ICC) and National Fire Protection Association (NFPA) who continue to allow the use of their source material and to clarify code requirements so that they can be accurately represented in this text.

I want to thank the building and associated industry representatives who continue to allow the use of their images and products such as Viking Group, APCO Graphics, Steelcraft Manufacturing, Underwriters Laboratories, and ACT. They make it possible to give real examples and images of code related elements.

Even though this book is on its sixth edition, the creation of the final product is defined by new technologies, processes and people each time. For perspective, the submission process for the first edition that I worked on, involved a large amount of paper and shipping time for delivery of edited material: now, the process occurs almost instantaneously and completely through cyberspace. So, for my first

solo mission on this edition, I uniquely appreciate those at John Wiley & Sons, Inc. who helped me through this process-sometimes step by step including Paul Drougas, Amy Odum and Lauren Poplawski. I also appreciate Lauren Olesky's direction and encouragement for the added task to create supplementary resources, stretching this edition's effectiveness beyond the book's pages. I appreciate all those at John Wiley who continue to be advocates for this book, to value its unique place in the industry and have been integral to its development, past and present.

I would particularly like to thank the readers, who continue to buy and recommend the book. Whether you use this book as an educator or student or for your own personal professional development, your feedback and support of the book is what motivates me to keep this endeavor up to date and pertinent to the industry. I hope that this relationship continues to benefit the design community and safe building environments.

INTRODUCTION

HOW TO USE THIS BOOK

Codes, standards, and federal regulations are an essential part of designing building interiors. Whether space planning the interior of a new building, designing a new tenant space in part of a building, or making some minor changes in an existing building, all of these requirements must be taken into consideration. They should become a natural part of every interior project.

The Codes Guidebook for Interiors is designed to assist in the process of determining which codes and regulation apply to a project. This book is intended to help whether you are an architect, interior designer, engineer, building owner, or facility manager. Most of the code publications address the entire building—exterior and interior—as well as the structure of the building itself. This book concentrates on the codes that pertain to the interior of a building, helping you to minimize your research time. It will make the many interior codes, standards, and federal regulations user-friendly.

In this sixth edition of the *Codes Guidebook*, each section has been updated to inform you of the most current interior-related codes, standards, and federal regulations. Using the 2012 edition of the codes, this book concentrates on the requirements of the *International Building Code* and the *Life Safety Code*, two of the most widely used codes. The most current accessibility and sustainability requirements are discussed as well, including the *2010 ADA Standards*. Some chapters also discuss interior-related information from the fire codes, the electrical and energy-related codes, and the plumbing and mechanical codes, including any pertinent information on performance and alternative requirements.

Because it explains how the various codes, standards, and federal regulations must be used together, this book will assist you in your code research. It will provide you with multiple examples, explanatory

Note

This book deals with interior codes only. Unless otherwise noted, it is assumed that the exterior walls—including doors and windows—and the existing shell of the building are either existing or already determined.

diagrams, and checklists to help you to eliminate costly mistakes and time-consuming changes in a project.

DEFINITIONS

Here are some common terms used throughout this book. Additional terms are defined in the glossary in the back of the book.

ACCESSIBLE: Unless otherwise noted, this term refers to areas, products, or devices usable by persons with disabilities, as required by the codes, federal legislation such as the Americans with Disabilities Act, and accessibility standards.

AUTHORITY HAVING JURISDICTION (AHJ): Used by the code organizations to indicate organizations, offices, or individuals that administer and enforce the codes. In this book we designate these as *code jurisdictions*, *code departments*, and *code officials*, respectively.

CODE OFFICIAL: Also known as a *building official*; an employee of a codes department who has the authority to interpret, administer, and enforce the codes, standards, and regulations within that jurisdiction. A code official can have a number of different titles, including plans examiner, building inspector, and, sometimes, fire marshal. Also generally referred to as the AHJ by the codes.

CODES DEPARTMENT: A local government agency that administers and enforces the codes within a jurisdiction. Some small jurisdictions may have a codes department that consists of only one person or code official, while some large jurisdictions may include many different agencies and departments. Also generally referred to as the AHJ by the codes.

GREEN DESIGN: Design of products, environments, and buildings that treats environmental attributes as an important design objective. It aims to minimize the potential harmful effects on human health and the environment by choosing eco-friendly building materials and construction practices. It may also include systems that increase the efficiency of a building so that it uses less materials, energy, and water. (See also Sustainable Design.)

JURISDICTION: A determined geographical area that uses the same codes, standards, and regulations. Each jurisdiction passes a law specifying which codes and standards are required and how they will be regulated. A jurisdiction can be as small as a township or as large as an entire state. The code jurisdiction of a project is determined by the location of the building. Also generally referred to as the AHJ by the codes.

PERFORMANCE CODE: A code that is more generally described and gives an objective but not specific instructions on how to achieve it. The focus is on the desired outcome, not a single solution, and compliance is based on meeting the criteria established by the performance code. (Engineering tools and methodologies are often used to substantiate the use of the code criteria.)

PRESCRIPTIVE CODE: A code providing a specific requirement that must be met for the design, construction, and maintenance of a building. The focus is on a specific solution to achieve an objective or outcome based on historical experience and established engineering. Historically, codes in the United States have been prescriptive in nature.

SUSTAINABLE DESIGN: More encompassing than green design, sustainability typically includes three main tenets: environmental responsibility, economic strength, and social responsibility. Buildings and spaces that incorporate sustainable design are designed to lessen their impact on the environment, stimulate the economy, and provide improvements to those involved in the development and the community.

 **Note**

Sustainable design and green design are not the same; sustainable design is more comprehensive.

USING CODES IN THE DESIGN PROCESS

The best time to research codes and use this book is in the early stages of a design project, preferably in the programming phase while the designs are still preliminary, before construction documents are started and construction costs are estimated. Figure I.1 summarizes how the various phases in the traditional design process relate to the typical steps taken during the code process. Refer to this chart as you work on a project to make sure you are covering the necessary code steps.

(A more detailed flowchart of the code process is included in Chapter 10.) The *Codes Guidebook* is organized so that you can follow it while working on a design project from beginning to end, in the order in which you would typically research the codes.

Design Process	Code Process	Description
Programming/ Pre-design	Preliminary Research	<ul style="list-style-type: none"> • Determine applicable codes, standards, and federal regulations • Preliminary code research to determine important code issues such as occupancy type, occupancy load, etc. • Determine level of sustainability required: code, standard, rating system, and/or a green building program
Schematic/ Conceptual Design		<ul style="list-style-type: none"> • Incorporate code and sustainability compliance into design, keeping in mind means of egress, rated walls, etc.
Design Development	Preliminary Review	<ul style="list-style-type: none"> • Meet with code official to review conflicting code requirements (optional unless using performance codes, but could be helpful) • May also be done during Schematic Design Phase
Construction Documents		<ul style="list-style-type: none"> • Check specific technical requirements such as aisle widths, stair dimensions, clearances, finish classifications • Compare code, sustainability, and accessibility requirements • Incorporate requirements into final design • Specify and/or detail items as required to meet codes, standards, and federal requirements
Bidding Process	Permitting Process	<ul style="list-style-type: none"> • Contractor applies for building permit
Purchasing		<ul style="list-style-type: none"> • As items are ordered, confirm compliance with applicable codes and standards
Construction Administration	Inspection Process	<ul style="list-style-type: none"> • Code officials review work by contractor to confirm that work complies with approved construction documents, including any incorporated performance and/or sustainability requirements
Client Move-in	Final Inspection	<ul style="list-style-type: none"> • Final code approval of construction must occur before client can move in
Post-Occupancy Evaluation		<ul style="list-style-type: none"> • Provide clients with documentation necessary for them to maintain building and/or contents as required for codes and standards (including performance and sustainability items)

Figure I.1 Comparison of design and code process.

ORGANIZATION OF THE BOOK

Chapter 1 in *The Codes Guidebook for Interiors* gives a brief history of codes and provides some background on each of the main code publications, federal regulations, and standards organizations. Although this edition concentrates on the International Codes® (I-Codes®) by the International Code Council (ICC), there are other widely used codes, such as the *NFPA 101 Life Safety Code (LSC)* and the *National Electrical Code (NEC)*. Chapter 1 explains all of these codes. Chapter 1 is helpful in determining which codes and standards publications and which federal regulations apply to an interior project. Chapter 10, the last chapter in this book, discusses code officials and the code process. It describes how they work and how to work with them, as well as how to document the codes you research. If you are new to codes research, you may want to review Chapter 10 to gain a basic understanding before reading the rest of the book.

Each of the remaining chapters pertains to a specific code concept and discusses the related code, standard, and federal requirements for that topic using the publications summarized in Chapter 1. The chapters have been organized in the order in which these issues are typically considered during an interior project. Once you have used Chapter 1 to determine which publications apply to your project, we suggest you research the codes and standards in the following order:

- Occupancy Classifications and Loads (Chapter 2)
- Construction Types and Building Sizes (Chapter 3)
- Means of Egress (Chapter 4)
- Fire and Smoke Resistant Assemblies (Chapter 5)
- Fire Protection Systems (Chapter 6)
- Plumbing and Mechanical Requirements (Chapter 7)
- Electrical and Communication Requirements (Chapter 8)
- Finish and Furniture Selection (Chapter 9)

Like the code publications, most of the chapters in this book build on and add to the preceding ones. For example, the occupancy classifications in Chapter 2 are important because many of the other codes are based on the occupancy of a building or space. Therefore, it is suggested that the first-time user read this book in the order in which it is written and use it as a guide while referencing the actual codes, standards, and federal publications. Each chapter in the book includes the

Note

All codes can be divided into two types. In the past, most codes were considered *prescriptive-type* codes. These codes require specific compliance. Today, more *performance-type* codes are being developed, which allow more than one solution to achieve the same results.
