APPLYING THE BUILDING CODE
STEP-BY-STEP GUIDANCE FOR DESIGN AND BUILDING PROFESSIONALS
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WILEY
Applying the Building Code: Step-by-Step Guidance for Design and Building Professionals
APPlying the Building Code: Step-by-Step Guidance for Design and Building Professionals

Based on the 2015 International Codes®

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A former Hamilton County, Ohio, building commissioner and a prolific writer, Ralph encouraged me to write and advised me at the beginning.
Unfortunately, he was not able to see the final result.
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Preface

ABOUT THIS BOOK

Building codes are complex documents and they get more complex every time they are revised. However, the methods used to educate design professionals on the proper application of the building code have largely focused on explaining the code on a requirement-by-requirement basis—devoid of any explanation on how or when the code requirements are applied within the context of the building design process. This book fills that void by explaining the building code using a straightforward step-by-step method that conforms to the standard design phases that design professionals have used for decades.

The American Institute of Architects (AIA; www.aia.org) has established five phases of basic services that are described in its Document B101-2007, Standard Form of Agreement Between Owner and Architect, which consist of the following:

- Schematic design phase
- Design development phase
- Construction documents phase
- Bidding or negotiation phase
- Construction phase

The first three phases make up the design phases of a project, which involves the architect taking the owner’s requirements (i.e., program) and transforming them into a set of drawings and specifications that eventually form the basis of a construction contract between the owner and contractor. This book offers a step-by-step process for applying the building code based on the three design phases of an architect’s basic services.

HOW TO USE THIS BOOK

This book is not intended to be used in lieu of the building code, since the building code provides more requirements than what could be adequately discussed in this book. The book intentionally does not replicate requirements in the code but directs the user to the specific location where
the information can be found. Therefore, to properly use this book, a copy of the building code must be available.

The steps within each design phase are placed in a logical order based on the availability of project information, some of which is provided by previous steps. However, not all steps must follow the sequence exactly as presented in this book—slight alterations can be made to adjust for project-specific situations. Additionally, one step does not need to be completed before the next step can begin. Many of the steps can be accomplished concurrently.

The steps are placed in the latest possible phase they can be accomplished with minimal risk to the project. If a step is accomplished in a later phase, there is a possibility that portions of the design may need to be revised, costing time and money. For example, waiting until the construction documents phase to calculate occupant load may require redesign of the egress system (e.g., adding doors, widening stairways and corridors) or restroom facilities (e.g., adding plumbing fixtures) and could have a domino effect by impacting other elements of the building design. Similarly, accomplishing a step earlier in the process may affect time and money by performing unnecessary work that may need to be abandoned or revised significantly. However, there are some steps that may be accomplished earlier with little to no risk to the project.

Design professionals are frequently retained to provide predesign services that may include site selection and programming. While performing these predesign services, the design professional has access to some basic project information and can accomplish some of the early steps indicated for the schematic design phase. For example, Steps 1 through 8 could be completed using data the design professional generated for the programming statement—information most design professionals get at the schematic design phase if they are hired only to perform basic services.

As previously mentioned, the step-by-step process is structured around the traditional design services provided by design professionals under common owner–architect agreements, such as those published by the AIA and ConsensusDocs (www.consensusdocs.org). However, with the various delivery methods in use today, the design professional may be bound under a variety of contractual arrangements that use alternate phasing. For example, if the design–build delivery method is used, then preliminary design and final design phases may be used in lieu of the three design phases previously mentioned. The same applies to contracts utilizing documents published by the Engineering Joint Contract Documents Committee (EJCDC; www.ejcdc.org). These documents may be used when an engineering firm is the prime design professional to the owner and the architect is a consultant to the engineering firm.

Even though the design phases used on a project may be different from those presented in this book, the step-by-step process can easily be adjusted to accommodate any type of delivery method. Regardless of the delivery method used, the steps and the order in which they are discussed should remain relatively unaltered—it is mostly a matter of where to stop at each phase. For example, if the design period is split into preliminary and final design phases, Steps 1 through 18 can be accomplished during preliminary design and the remaining steps accomplished during final design.

REFERENCES

Since referencing the contents within the various codes covered by this book, as well as content in other areas of this book, can be very confusing, all references made will conform to the following conventions:

- For referenced sections, tables, equations, and appendices from the various codes and standards covered, each reference will begin with the code’s or standard’s acronym followed by the type of item referenced (i.e., Section, Table, Equation, or Appendix) and the number. For example, "IBC
Section 104" refers to Section 104 of the International Building Code. See Part I “Code Basics” for acronyms used for the various codes and standards.

- For references to other areas within this book that are a part of the step-by-step process, the reference will be preceded by the word “Step” followed by the specific number reference. For example, “Step 7.3” refers to the “Determining Allowable Area” section of Step 7.
- For references to other areas within this book that are not part of the step-by-step process, the reference will identify the part number (i.e., I, V, or VI) followed by the title of the specific area within the Part. For example, Part VI “The Building Official” refers to the section titled “The Building Official” located in Part VI.
- References to an appendix that is not preceded by an acronym refer to the appendix within this book.

**TERMINOLOGY**

Identification of building code terminology used in this book is similar to that used in the IBC with some exceptions. The descriptions below explain how terminology is used in this book:

<table>
<thead>
<tr>
<th>Term Format</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>IBC term</em></td>
<td>Terms used within the IBC will be italicized as indicated. Use the IBC to obtain the definition.</td>
</tr>
<tr>
<td>Example: <em>Fire areas</em> are used in determining sprinkler requirements.*</td>
<td></td>
</tr>
<tr>
<td><em>Other code term (Code)</em></td>
<td>Terms used in other codes referenced by the IBC are also italicized but will be followed by the acronym for the code in which the term is defined. Since many terms are defined in multiple ICC codes, if a term is provided in the IBC, then it will be considered an IBC term unless specifically identified with another code. Example: When the existing occupancy group is changed, it is considered a change of occupancy (IEBC).*</td>
</tr>
<tr>
<td><em>Noncode term</em></td>
<td>Terms defined by sources other than a code will be bold and italicized. The definitions for these terms are provided in this book.</td>
</tr>
</tbody>
</table>

**EXAMPLE PROJECT**

To assist in illustrating the application of the step-by-step process, an example project is used throughout all steps provided. The project is a mixed-use residential building that incorporates apartments, parking, amenity, and commercial uses.

Although individual examples are used throughout the book to explain specific applications of code requirements, the use of a single example project for all steps will explain how the level of information available at that phase of design can be used when applying the building code. Additionally, the example project will also show how information collected and decisions made during previous steps are used for subsequent steps.

A copy of the programming statement for the example project is located in Appendix A.
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APPLYING THE BUILDING CODE: STEP-BY-STEP GUIDANCE FOR DESIGN AND BUILDING PROFESSIONALS
The International Building Code® (IBC), like the history of model building codes before it, does not intend that a building be designed in a particular manner or style or that it must use certain materials. The IBC establishes minimum requirements for the protection of public health, safety, and welfare, but within those requirements is great flexibility for the design professional. Some code requirements offer only one method for compliance, but many have options or alternatives for the design professional to consider. It is the design professional’s responsibility to consider these code options and alternatives and compare them to the owner’s program requirements and budget, as well as the design professional’s own design vision for the building, to decide which option provides the most value for the building’s owner.