

2021 Washington State Fire Code  
Includes Washington State Amendments (Chapter 51-54A WAC)  
Effective in Washington State March 15, 2024

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# PREFACE

## Authority

The *International Fire Code*<sup>®</sup> (Chapter 51-54A WAC) is adopted by the Washington State Building Code Council pursuant to Chapters 19.27 and 70.92 RCW. These codes were first adopted by reference by the Washington State Legislature in 1974. In 1985, the Legislature delegated the responsibility of adoption and amendment of these codes to the State Building Code Council.

## Code Precedence

The State Building Code Act, Chapter 19.27 RCW, establishes the following order of precedence among the documents adopted as parts of the State Building Code:

*International Building Code*, Standards and amendments—WAC 51-50;

*International Residential Code*, Standards and amendments—WAC 51-51;

*International Mechanical Code*, Standards and amendments—WAC 51-52;

*International Fire Code*, Standards and amendments—WAC 51-54A;

*International Wildland Urban Interface Code*—WAC 51-55;

*Uniform Plumbing Code*, Standards and amendments—WAC 51-56.

Where there is a conflict between codes, an earlier-named code takes precedence over a later-named code. In the case of a conflict between the duct insulation requirements of the *International Mechanical Code* and the duct insulation requirements of the Energy Code, the Energy Code, or where applicable, a local jurisdiction's energy code, shall govern.

Where, in any specific case, different sections of this Code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is conflict between a general requirement and a specific requirement, the specific requirement shall be applicable.

## Organization and Numbering

These rules are written to allow compatible use with the *International Fire Code*. All sections which are amended, deleted, or added are referenced.

## Enforcement

The State Building Code Act requires that each local jurisdiction enforce the *State Building Code* within its jurisdiction. Any jurisdiction can contract with another jurisdiction or an inspection agency to provide the mandated enforcement activities.

## Amendments to the State Building Code

The State Building Code Council has adopted review procedures and approval criteria for local amendments. These procedures and criteria are found in Chapter 51-04 WAC. The Council has exempted from its review any amendments to the administrative provisions of the various codes.

Forms for proposing statewide amendments to the *State Building Code* are available from the State Building Code Council staff.

- A. Amendments of Statewide Application:** The State Building Code Council will consider proposals to amend the *State Building Code* every 3 years to coincide with the publication of the new model code editions. The Council is not scheduled to enter formal rulemaking until 2024 as part of its consideration of adoption of the 2024 series of codes.

Proposals to amend the *State Building Code* shall be made on forms provided by the Building Code Council.

- B. Local Amendments:** Any jurisdiction may amend the *State Building Code* provided the amendments do not reduce the minimum performance standards of the codes. There are two areas where local amendments are limited or prohibited:

**Prohibited Amendments:** Residential provisions of the State Energy Code (WAC 51-11R and WAC 51-11C), Ventilation provisions in Section 408 of the Mechanical Code (WAC 51-52) and Section M1507 of the IRC (WAC 51-51); any provision of the *International Building Code* or *International Residential Code* affecting accessibility; and standards specifically adopted in Chapters 19.27 and 19.27A RCW cannot be amended by any local jurisdiction.

**Residential Amendments:** Amendments by local jurisdictions which affect the construction of single family and multi-family residential buildings must be reviewed and approved by the State Building Code Council before such amendments can be enforced. The State Building Code Act provides the following definition:

**Multi-family residential building:** means common wall residential buildings that consist of four or fewer units, that do not exceed two stories in height, that are less than 5,000 square feet in area, and that have a 1-hour fire-resistive occupancy separation between units.

Application forms for Council review of local amendments are available from the State Building Code Council Staff.

Washington State Building Code Council  
Post Office Box 41449  
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[www.sbcc.wa.gov](http://www.sbcc.wa.gov)  
(360) 407-9255  
e-mail: [sbcc@des.wa.gov](mailto:sbcc@des.wa.gov)

## Effective Date

These rules were adopted by the State Building Code Council on November 8, 2022. These rules are effective throughout the state on March 15, 2024.

## Building Permit Fees

The activities of the State Building Code Council are supported by permit fees collected by each city and county. Section 19.27.085 of the State Building Code Act requires that a fee of \$6.50 be imposed on each residential building permit and \$25.00 for each commercial building permit issued by each city and county. In addition, a fee of \$2.00 per unit shall be imposed for each dwelling unit after the first unit, on each building containing more than one residential unit. For the purpose of this fee, WAC 365-110-035 defines building permits as any permit to construct, enlarge, alter, repair, move, improve, remove, convert or demolish any building or structure regulated by the Building Code. Exempt from the fee are plumbing, electrical and mechanical permits, permits issued to install a mobile/manufactured home, commercial coach or factory-built structure, or permits issued pursuant to the *International Fire Code*®.

Each city and county shall remit monies collected to the state treasury quarterly. No remittance is required until a minimum of \$50.00 has accumulated.

These permit fees are the amounts current in January 2023. Such fees may be changed by the State Legislature.

## Opinions

RCW 19.27.031 grants the council authority to render opinions relating to the building code at the request of a local code official. For the purposes of this section, the term “code official” means the local or state official, or their designee, responsible for implementation and enforcement of the specific code provision on which the opinion is requested.

At the request of a code official, the council will issue opinions relating to the codes adopted under chapters 19.27, 19.27A, and 70.92 RCW, and council amendments to the model codes. At the request of a local code official, the council may issue opinions on the applicability of WAC 51-04-030 to a local government ordinance regulating construction. Council related opinions may be developed and approved by a standing committee of the council.

Opinions approved by a standing committee may be reviewed and modified by the council.

## Introduction

The *International Fire Code*® (IFC®) establishes minimum requirements for fire prevention and fire protection systems using prescriptive and performance-related provisions. It is founded on broad-based principles that make possible the use of new materials and new system designs. This 2021 edition is fully compatible with all of the International Codes® (I-Codes®) published by the International Code Council® (ICC®), including the *International Building Code*® (IBC®), *International Energy Conservation Code*® (IECC®), *International Existing Building Code*® (IEBC®), *International Fuel Gas Code*® (IFGC®), *International Green Construction Code*® (IgCC®), *International Mechanical Code*® (IMC®), *International Plumbing Code*® (IPC®), *International Private Sewage Disposal Code*® (IPSDC®), *International Property Maintenance Code*® (IPMC®), *International Residential Code*® (IRC®), *International Swimming Pool and Spa Code*® (ISPSC®), *International Wildland-Urban Interface Code*® (IWUIC®), *International Zoning Code*® (IZC®) and *International Code Council Performance Code*® (ICCPC®).

The I-Codes, including the IFC, 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 US and in other countries. However, the impact of the codes extends well beyond the regulatory arena, as they are used in a variety of nonregulatory 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.
- US 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.

## Development

This 2021 edition presents the code as originally issued, with changes reflected in the 2003 through 2018 editions and further changes approved by the ICC Code Development Process through 2019. A new edition such as this is promulgated every 3 years.

## Maintenance

The IFC is 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, cdpAccess®. 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.

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 Institute of Architects (AIA)
- International Association of Fire Chiefs (IAFC)
- National Association of Home Builders (NAHB)
- National Association of State Fire Marshals (NASFM)

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 ICC.

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.

## Code Development Committee Responsibilities (Letter Designations in Front of Section Numbers)

In each code development cycle, proposed changes to this code are considered at the Committee Action Hearings by the International Fire Code Development Committee, whose action constitutes a recommendation to the voting membership for final action on the proposed change. Code change proposals to sections of the code that are preceded by a bracketed letter designation are considered by a different code development committee. For example, proposed changes to code sections that have [BE] in front of them (e.g., [BE] 604.4) are considered by the appropriate International Building Code Development Committee (IBC—Egress) at the code development hearings.

The bracketed letter designations for committees responsible for portions of this code are as follows:

- [A] = Administrative Code Development Committee
- [BE] = IBC—Egress Code Development Committee
- [BF] = IBC—Fire Safety Code Development Committee
- [BG] = IBC—General Code Development Committee
- [BS] = IBC—Structural Code Development Committee
- [EB] = International Existing Building Code Development Committee
- [FG] = International Fuel Gas Code Development Committee
- [M] = International Mechanical Code Development Committee
- [P] = International Plumbing Code Development Committee

For the development of the 2024 edition of the I-Codes, there will be two groups of code development committees and they will meet in separate years, as shown in the following Code Development Hearings table.

The majority of the sections of Chapter 1 of this code are designated as the responsibility of the Administrative Code Development Committee, and that committee is part of the Group B portion of the hearings. This committee will conduct its code development hearings in 2022 to consider most code change proposals for Chapter 1 of this code and proposals for Chapter 1 of all I-Codes except the IECC, IRC and IgCC. Therefore, any proposals received for Chapter 1 of this code preceded by the designation [A] will be assigned to the Administrative Code Development Committee for consideration in 2022.

It is very important that anyone submitting code change proposals understands which code development committee is responsible for the section of the code that is the subject of the code change proposal. For further information on the Code Development Committee responsibilities, please visit the ICC website at [www.iccsafe.org/current-code-development-cycle](http://www.iccsafe.org/current-code-development-cycle).

#### CODE DEVELOPMENT HEARINGS

| <b>Group A Codes<br/>(Heard in 2021, Code Change Proposals<br/>Deadline: January 11, 2021)</b>  | <b>Group B Codes<br/>(Heard in 2022, Code Change Proposals<br/>Deadline: January 10, 2022)</b>   |
|---|--|
| <b>International Building Code</b><br>– Egress (Chapters 10, 11, Appendix E)<br>– Fire Safety (Chapters 7, 8, 9, 14, 26)<br>– General (Chapters 2–6, 12, 27–33,<br>Appendices A, B, C, D, K, N) | Administrative Provisions (Chapter 1 of all codes except IECC, IRC and IgCC; IBC Appendix O; the appendices titled “Board of Appeals” for all codes except IECC, IRC, IgCC, ICCPC and IZC; administrative updates to currently referenced standards; and designated definitions) |
| <b>International Fire Code</b>  | <b>International Building Code</b><br>– Structural (Chapters 15–25, Appendices F, G, H, I, J, L, M)  |
| <b>International Fuel Gas Code</b>  | <b>International Existing Building Code</b>  |
| <b>International Mechanical Code</b>  | <b>International Energy Conservation Code—Commercial</b>   |
| <b>International Plumbing Code</b>  | <b>International Energy Conservation Code—Residential</b><br>– IECC—Residential<br>– IRC—Energy (Chapter 11)   |
| <b>International Property Maintenance Code</b>  | <b>International Green Construction Code (Chapter 1)</b>   |

**CODE DEVELOPMENT HEARINGS — continued**

|  |  |
|--|--|
| <b>International Private Sewage Disposal Code</b>  | <b>International Residential Code</b><br>– IRC—Building (Chapters 1–10, Appendices AE, AF, AH, AJ, AK, AL, AM, AO, AQ, AR, AS, AT, AU, AV, AW) |
| <b>International Residential Code</b><br>– IRC—Mechanical (Chapters 12–23)<br>– IRC—Plumbing (Chapters 25–33, Appendices AG, AI, AN, AP) |  |
| <b>International Swimming Pool and Spa Code</b>  |  |
| <b>International Wildland-Urban Interface Code</b>   |  |
| <b>International Zoning Code</b>   |  |

**Note:** Proposed changes to the *ICCPC* will be heard by the code development committee noted in brackets [ ] in the text of the *ICCPC*.

## Marginal Markings

**For Digital Codes Basic and Premium services,** technical code changes from the previous edition of the International Codes are shown in blue text. Washington State amendments to the International Codes are shown in red text. Information regarding relocated text or tables is provided at the new and previous locations and linked.

**For print and PDF versions of the code,** a solid vertical line in the margin within the body of the code indicates a technical change from the requirements of the previous edition of the International Codes. Double vertical lines in the margin within the body of the code indicate Washington State amendments. A single asterisk [\*] placed in the margin indicates that text or a table has been relocated within the code. A double asterisk [\*\*] placed in the margin indicates that the text or table immediately following it has been relocated there from elsewhere in the code.

**For all mediums,** a solid arrow (➡) provided in the margin indicates where an entire section, paragraph, exception or table has been deleted or an item in a list of items or a row in a table has been deleted from the International Codes. An open caret (>) is provided in the margin to indicate a deleted paragraph or item from the Washington State Code. The reader is advised that Washington Administrative Code (WAC) amendments may also contain changes in the base code. State amendments supersede changes made to the base code.

**RELOCATIONS**

| <b>2021 LOCATION</b> | <b>2018 LOCATION</b> |
|----------------------|----------------------|
| 106.1–106.4          | 105.4–105.4.6        |
| 107                  | 106                  |
| 108                  | 107                  |
| 109                  | 108                  |
| 110                  | 113                  |
| 111                  | 109                  |
| 112                  | 110                  |
| 113                  | 112                  |
| 114                  | 111                  |
| 603                  | 604                  |
| 604                  | 606                  |

## RELOCATIONS — continued

|          |            |
|----------|------------|
| 605      | 603        |
| 606      | 607        |
| 607      | 608        |
| 608      | 605        |
| 3303     | 3308       |
| 6303.1.5 | 6303.1.1.2 |

## Coordination of the International Codes

The coordination of technical 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 technical provisions. Individual codes can also be used in subsets or as stand-alone documents. To make sure that each individual code is as complete as possible, some technical provisions that are relevant to more than one subject area are duplicated in some of the model codes. This allows users maximum flexibility in their application of the I-Codes.

## Italicized Terms

Terms italicized in code text, other than document titles, are defined in Chapter 2. The terms selected to be italicized have definitions that the user should read carefully to better understand the code. Where italicized, the Chapter 2 definition applies. If not italicized, common-use definitions apply.

## Adoption

The ICC maintains a copyright in all of its codes and standards. Maintaining copyright allows ICC to fund its mission 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 form on the ICC's website. Jurisdictions should contact the ICC at [adoptions@iccsafe.org](mailto:adoptions@iccsafe.org) to learn how to adopt and distribute laws based on the IFC in a manner that provides necessary access, while maintaining the ICC's copyright.

To facilitate adoption, several 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]**

Section 112.4. Insert: **[OFFENSE, DOLLAR AMOUNT, NUMBER OF DAYS]**

Section 1103.5.3. Insert: **[DATE BY WHICH SPRINKLER SYSTEM MUST BE INSTALLED]**

Section 5704.2.9.6.1. Insert: **[JURISDICTION TO SPECIFY]**

Section 5706.2.4.4. Insert: **[JURISDICTION TO SPECIFY]**

Section 5806.2. Insert: **[JURISDICTION TO SPECIFY]**

Section 6104.2. Insert: **[JURISDICTION TO SPECIFY]**



## Effective Use of the International Fire Code

The IFC is a model code that regulates minimum fire safety requirements for new and existing buildings, facilities, storage and processes. The IFC addresses fire prevention, fire protection, life safety and safe storage and use of hazardous materials in new and existing buildings, facilities and processes. The IFC provides a total approach of controlling hazards in all buildings and sites, regardless of the hazard being indoors or outdoors.

The IFC is a design document. For example, before one constructs a building, the site must be provided with an adequate water supply for fire-fighting operations and a means of building access for emergency responders in the event of a medical emergency, fire or natural or technological disaster. Depending on the building's occupancy and uses, the IFC regulates the various hazards that may be housed within the building, including refrigeration systems, application of flammable finishes, fueling of motor vehicles, high-piled combustible storage, and the storage and use of hazardous materials. The IFC sets forth minimum requirements for these and other hazards and contains requirements for maintaining the life safety of building occupants; protecting emergency responders; and limiting the damage to a building and its contents as the result of a fire, explosion or unauthorized hazardous material discharge.

As described, the IFC has many types of requirements for buildings and facilities. The applicability of these requirements varies. An understanding of the applicability of requirements, as addressed in Sections 102.1 and 102.2, is necessary. Section 102.1 addresses when the construction and design provisions are applicable, whereas Section 102.2 addresses when the administrative, operational and maintenance provisions are applicable. Generally, the construction and design provisions apply to only new buildings or existing buildings and occupancies as addressed by Chapter 11. The administrative, maintenance and operational requirements are applicable to all buildings and facilities, whether new or existing.

# ARRANGEMENT AND FORMAT OF THE 2021 IFC

Before applying the requirements of the IFC, it is beneficial to understand its arrangement and format. The IFC, like other codes published by the ICC, is arranged and organized to follow sequential steps that generally occur during a plan review or inspection.

The IFC is organized into seven parts. Each part represents a broad subject matter and includes the chapters that logically fit under the subject matter of each part. It is also foreseeable that additional chapters will need to be added in the future as regulations for new processes or operations are developed. Accordingly, the structure was designed to accommodate such future chapters by providing reserved (unused) chapters in several of the parts. This will allow the subject matter parts to be conveniently and logically expanded without requiring a major renumbering of the IFC chapters.

## CHAPTER TOPICS

| Parts and Chapters                       | Subjects                               |
|--|--|
| Part I—Chapters 1 and 2                  | Administrative and definitions         |
| Part II—Chapters 3 and 4                 | General safety provisions              |
| Part III—Chapters 5 through 12           | Building and equipment design features |
| Part III—Chapters 13 through 19          | Reserved for future use                |
| Part IV—Chapters 20 through 40           | Special occupancies and operations     |
| Part IV—Chapters 41 through 49; 52       | Reserved for future use                |
| Part V—Chapters 50, 51 and 53 through 67 | Hazardous materials                    |
| Part V—Chapters 68 through 79            | Reserved for future use                |
| Part VI—Chapter 80                       | Referenced standards                   |
| Part VII—Appendices A through N          | Adoptable and informational appendices |

## IBC Correlated Topics

The IFC requirements for fire-resistance-rated construction, interior finish, fire protection systems, means of egress and construction safeguards are directly correlated to the chapters containing parallel requirements in the IBC, as follows:

### IFC/IBC CORRELATED TOPICS

| IFC Chapter/Section | IBC Chapter/Section    | Subject  |
|---------------------|------------------------|--|
| Chapter 7           | Chapter 7              | Fire and smoke protection features (Fire-resistance-rated construction in the IBC) |
| Chapter 8           | Chapter 8              | Interior finish, decorative materials and furnishings                              |
| Chapter 9           | Chapter 9              | Fire protection and life safety systems  |
| Chapter 10          | Chapter 10             | Means of egress  |
| Section 1203        | Chapter 27             | Emergency and standby power  |
| Chapter 31          | Section 3103           | Temporary structures   |
| Chapter 33          | Chapter 33             | Construction fire safety   |
| Chapters 50–67      | Sections 307, 414, 415 | Hazardous materials and Group H requirements                                       |

## **PART I—ADMINISTRATIVE**

### **Chapter 1 Scope and Administration**

Chapter 1 contains provisions for the application, enforcement and administration of subsequent requirements of the code. In addition to establishing the scope of the code, Chapter 1 identifies which buildings and structures come under its purview. Chapter 1 is largely concerned with maintaining “due process of law” in enforcing the regulations contained in the body of the code. Only through careful observation of the administrative provisions can the code official reasonably expect to demonstrate that “equal protection under the law” has been provided.

### **Chapter 2 Definitions**

All terms that are defined in the code are listed alphabetically in Chapter 2. While a defined term may be used in one chapter or another, the meaning provided in Chapter 2 is applicable throughout the code.

Where understanding of a term’s definition is especially key to or necessary for understanding of a particular code provision, the term is shown in italics wherever it appears in the code. This is true only for those terms that have a meaning that is unique to the code. In other words, 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.

Guidance regarding tense, gender and plurality of defined terms as well as guidance regarding terms not defined in this code are also provided.

## **PART II—GENERAL SAFETY PROVISIONS**

### **Chapter 3 General Requirements**

The open burning, ignition source, vacant building, miscellaneous storage, roof gardens and landscaped roofs, artificial combustible vegetation on buildings, outdoor pallet storage, additive manufacturing, and hazards to fire fighters requirements and precautions, among other general regulations contained in this chapter, are intended to improve premises safety for everyone, including construction workers, tenants, operations and maintenance personnel, and emergency response personnel.

### **Chapter 4 Emergency Planning and Preparedness**

Chapter 4 addresses the human contribution to life safety in buildings when a fire or other emergency occurs. The requirements for continuous training and scheduled fire, evacuation and lockdown drills can be as important as the required periodic inspections and maintenance of built-in fire protection features. The level of preparation by the occupants also improves the emergency responders’ abilities during an emergency. The *IBC* focuses on built-in fire protection features, such as automatic sprinkler systems, fire-resistance-rated construction and properly designed egress systems, whereas this chapter fully addresses the human element.

## **PART III—BUILDING AND EQUIPMENT DESIGN FEATURES**

### **Chapter 5 Fire Service Features**

The requirements of Chapter 5 apply to all buildings and occupancies and pertain to access roads, access to building openings and roofs, premises identification, key boxes, fire protection water supplies, fire command centers, fire department access to equipment, and in-building emergency responder communication system coverage.

## **Chapter 6 Building Services and Systems**

Chapter 6 focuses on building systems and services as they relate to potential safety hazards and when and how they should be installed. This chapter brings together building system- and service-related issues for convenience and provides a more systematic view of buildings. The following building services and systems are addressed: electrical equipment, wiring and hazards (Section 603); elevator recall and maintenance (Section 604); fuel-fired appliances (Section 605); commercial kitchen hoods (Section 606); commercial kitchen cooking oil storage (Section 607); mechanical refrigeration (Section 608); hyperbaric facilities (Section 609); and clothes dryer exhaust systems (Section 610). Note that building systems focused on energy systems and components are addressed by Chapter 12.

## **Chapter 7 Fire and Smoke Protection Features**

The maintenance of assemblies required to be fire-resistance rated is a key component in a passive fire protection philosophy. Chapter 7 sets forth requirements to maintain required fire-resistance ratings of building elements and limit fire spread. Section 701 addresses the basics of what construction elements such as fire barriers and smoke barriers need to be maintained as well as defining the owner's responsibility. The rest of the chapter, Sections 703 through 708, deals with various fire and smoke protection features that must also be maintained. These features include penetrations, joint protection, door and window openings, duct and air transfer opening protection, concealed spaces, and spray-applied fire-resistant and intumescent fire-resistant materials.

## **Chapter 8 Interior Finish, Decorative Materials and Furnishings**

The overall purpose of Chapter 8 is to regulate interior finishes, decorative materials and furnishings in new and existing buildings so that they do not significantly add to or create fire hazards within buildings. The provisions tend to focus on occupancies with specific risk characteristics, such as vulnerability of occupants, density of occupants, lack of familiarity with the building and societal expectations of importance. This chapter is consistent with Chapter 8 of the IBC, which regulates the interior finishes of new buildings.

## **Chapter 9 Fire Protection and Life Safety Systems**

Chapter 9 prescribes the minimum requirements for active systems of fire protection equipment to perform the functions of detecting a fire, alerting the occupants or fire department of a fire emergency, controlling smoke and controlling or extinguishing the fire. There are provisions relating to more general life safety systems such as gas detection and associated alarms. Mass notification systems are also addressed. Generally, the requirements are based on the occupancy, the height and the area of the building, because these are the factors that most affect fire-fighting capabilities and the relative hazard of a specific building or portion thereof. This chapter parallels and is substantially duplicated in Chapter 9 of the IBC; however, this chapter also contains periodic testing criteria that are not contained in the IBC. In addition, the special fire protection system requirements based on use and occupancy found in Chapter 4 of the IBC are duplicated in Chapter 9 of the IFC as a user convenience.

## **Chapter 10 Means of Egress**

The general criteria set forth in Chapter 10 regulating the design of the means of egress are established as the primary method for protection of people in buildings by allowing timely relocation or evacuation of building occupants. Both prescriptive and performance language is utilized in this chapter to provide for a basic approach in the determination of a safe exiting system for all occupancies. It addresses all portions of the egress system (i.e., exit access, exits and exit discharge) and includes design requirements as well as provisions regulating individual components. The requirements detail the size, arrangement, number and protection of means of egress components. Functional and operational characteristics also are specified for the components that will permit their safe use without special knowledge or effort. The means of egress protection requirements work in coordination with other sections of the code, such as protection of vertical openings (see Chapter 7), interior finish (see Chapter 8), fire suppression and detection systems (see Chapter 9) and numerous others, all having an impact on life safety. Sections 1002 through 1031 duplicate text from Chapter 10 of the IBC; however, the IFC contains an additional Section 1032 on maintenance of the means of egress system in existing

buildings. Retroactive minimum means of egress requirements for existing buildings are found in Chapter 11.

## **Chapter 11 Construction Requirements for Existing Buildings**

Chapter 11 applies to existing buildings constructed prior to the adoption of the code and intends to provide a minimum degree of fire and life safety to persons occupying existing buildings by providing for alterations to such buildings that do not comply with the minimum requirements of the IBC. Prior to the 2009 edition, its content existed in the IFC but in a random manner that was neither efficient nor user-friendly. In the 2007/2008 code development cycle, a code change (F294-07/ 08) was approved that consolidated the retroactive elements of IFC into a single chapter for easier and more efficient reference and application to existing buildings. The provisions address general fire safety features such as requirements for fire alarm systems, CO detection and automatic sprinkler systems in some existing buildings, general means of egress, and finally, the chapter contains a section dedicated to existing Group I-2 occupancies.

## **Chapter 12 Energy Systems**

Chapter 12 was added to address the current energy systems found in the IFC. The chapter covers a wide range of systems that generate and store energy in, on and adjacent to buildings and facilities. The expansion of such energy systems is related to meeting today's energy, environmental and economic challenges. Ensuring appropriate criteria to address the safety of such systems in building and fire codes is an important part of protecting the public at large, building occupants and emergency responders. Previously, requirements for energy systems, such as standby power systems, PV systems and stationary battery systems, were scattered about in various locations in Chapter 6, which addresses building services and systems. However, with the addition of fuel cells, energy storage systems and portable generators to the IFC, a chapter dedicated to such related issues was necessary. This chapter provides an appropriate location for the addition of future energy-related issues.

## **Chapters 13 through 19**

Reserved for future use.

## **PART IV—SPECIAL OCCUPANCIES AND OPERATIONS**

### **Chapter 20 Aviation Facilities**

Chapter 20 specifies minimum requirements for the fire-safe operation of airports, heliports and helistops. The principal nonflight operational hazards associated with aviation involve fuel, facilities and operations. Therefore, safe use of flammable and combustible liquids during fueling and maintenance operations is emphasized. Availability of portable Class B:C-rated fire extinguishers for prompt control or suppression of incipient fires is required.

### **Chapter 21 Dry Cleaning**

The provisions of Chapter 21 are intended to reduce hazards associated with the use of flammable and combustible dry cleaning solvents. These materials, like all volatile organic chemicals, generate significant quantities of static electricity and are thus readily ignitable. Many flammable and nonflammable dry cleaning solvents also create health hazards when involved in a fire.

### **Chapter 22 Combustible Dust-producing Operations**

The requirements of Chapter 22 seek to reduce the likelihood of dust explosions by managing the hazards of ignitable suspensions of combustible dusts associated with a variety of operations, including woodworking, mining, food processing, agricultural commodity storage and handling, and pharmaceu-

tical manufacturing, among others. Ignition source control and good housekeeping practices in occupancies containing dust-producing operations are emphasized.

## **Chapter 23 Motor Fuel-dispensing Facilities and Repair Garages**

Chapter 23 provides provisions that regulate the storage and dispensing of both liquid and gaseous motor fuels at public and private automotive, marine and aircraft motor fuel-dispensing facilities, and fleet vehicle motor fuel-dispensing facilities. In addition, this chapter addresses the various hazards created by the use of both liquid and gaseous fuels within repair garages.

## **Chapter 24 Flammable Finishes**

Chapter 24 requirements govern operations where flammable or combustible finishes are applied by spraying, dipping, powder coating or flow-coating processes. As with all operations involving flammable or combustible liquids and combustible dusts or vapors, controlling ignition sources and methods of reducing or controlling flammable vapors or combustible dusts at or near these operations are emphasized.

## **Chapter 25 Fruit and Crop Ripening**

Chapter 25 provides guidance that is intended to reduce the likelihood of explosions resulting from improper use or handling of ethylene gas used for crop ripening and coloring processes. This is accomplished by regulating ethylene gas generation, storage, and distribution systems and controlling ignition sources. Design and construction of facilities for this use are regulated by the *IBC* to reduce the impact of potential accidents on people and buildings.

## **Chapter 26 Fumigation and Insecticidal Fogging**

Chapter 26 regulates fumigation and insecticidal fogging operations that use toxic pesticide chemicals to kill insects, rodents and other vermin. Fumigants and insecticidal fogging agents pose little hazard if properly applied; however, the inherent toxicity of all these agents and the potential flammability of some makes special precautions necessary when they are used. Requirements of this chapter are intended to protect both the public and fire fighters from hazards associated with these products.

## **Chapter 27 Semiconductor Fabrication Facilities**

The requirements of Chapter 27 are intended to control hazards associated with the manufacture of electrical circuit boards or microchips, commonly called semiconductors. Though the finished product possesses no unusual hazards, materials commonly associated with semiconductor manufacturing are often quite hazardous and include flammable liquids, pyrophoric and flammable gases, toxic substances, and corrosives. The requirements of this chapter are concerned with both life safety and property protection. However, the fire code official should recognize that the risk of extraordinary property damages is far more common than the risk of personal injuries from fire.

## **Chapter 28 Lumber Yards and Agro-industrial, Solid Biomass and Woodworking Facilities**

Provisions of Chapter 28 are intended to prevent fires and explosions, facilitate fire control and reduce exposures to and from facilities storing, selling or processing wood and forest products, including sawdust, wood chips, shavings, bark mulch, shorts, finished planks, sheets, posts, poles, timber and raw logs and the hazard they represent once ignited. Also included are solid biomass feedstock and raw products associated with agro-industrial facilities, the outdoor storage of pallets, and manufacturing and recycling facilities. This chapter requires active and passive fire protection features to reduce on- and off-site exposures, limit fire size and development, and facilitate fire fighting by employees and the fire service.

## **Chapter 29 Manufacture of Organic Coatings**

Chapter 29 regulates materials and processes associated with the manufacture of paints as well as bituminous, asphaltic and other diverse compounds formulated to protect buildings, machines and objects from the effects of weather, corrosion and hostile environmental exposures. Paint for decorative, architectural and industrial uses comprises the bulk of organic coating production. Painting and processes related to the manufacture of nonflammable and noncombustible or water-based products are exempt from the provisions of this chapter. The application of organic coatings is covered by Chapter 24. Elimination of ignition sources, maintenance of fire protection equipment and isolation or segregation of hazardous operations are emphasized.

## **Chapter 30 Industrial Ovens**

Chapter 30 addresses the fuel supply, ventilation, emergency shutdown equipment, fire protection and the operation and maintenance of industrial ovens, which are sometimes referred to as industrial heat enclosures or industrial furnaces. Compliance with this chapter is intended to reduce the likelihood of fires involving industrial ovens, which are usually the result of the fuel in use or volatile vapors given off by the materials being heated, or to manage the impact if a fire should occur.

## **Chapter 31 Tents, Temporary Structures and Other Membrane Structures**

The requirements in Chapter 31 are intended to protect temporary as well as permanent tents and air-supported and other membrane structures and temporary special event structures from fire and similar hazards. These hazards are regulated through provisions related to structure location and access, anchorage, egress, heat-producing equipment, hazardous materials and operations, combustible vegetation, ignition sources, waste accumulation and requiring regular inspections and certifying continued compliance with fire safety regulations. This chapter also addresses outdoor assembly events, which are not limited to those events where tents or other membrane structures are used but are regulated due to the number of people, density of those people and hazards associated with large outdoor events related to egress, fire hazards from cooking and other related concerns.

## **Chapter 32 High-piled Combustible Storage**

Chapter 32 provides guidance for reasonable protection of life from hazards associated with the storage of combustible materials in closely packed piles or on pallets, in racks, or on shelves where the top of storage is greater than 12 feet in height. It provides requirements for identifying various classes of commodities; general fire and life safety features, including storage arrangements, smoke and heat venting, and fire department access; and housekeeping and maintenance requirements. The chapter attempts to define the potential fire severity and, in turn, determine fire and life safety protection measures needed to control, and in some cases suppress, a potential fire. This chapter does not cover miscellaneous combustible materials storage regulated in Section 315.

## **Chapter 33 Fire Safety during Construction and Demolition**

Chapter 33 outlines general fire safety precautions for all structures and all occupancies during construction and demolition operations. Most importantly, this chapter addresses owner responsibility and provides requirements for a site safety plan and requires a site safety director. Generally, these requirements seek to maintain required levels of fire protection, limit fire spread, establish the appropriate operation of equipment and promote prompt response to fire emergencies. Features regulated include fire protection systems, fire fighter access to the site and building, means of egress, hazardous materials storage and use, and temporary heating equipment and other ignition sources. This chapter is consistent with both Chapter 33 of the IBC and Chapter 15 of the IEBC.

## **Chapter 34 Tire Rebuilding and Tire Storage**

The requirements of Chapter 34 are intended to prevent or control fires and explosions associated with the remanufacture and storage of tires and tire byproducts. Additionally, the requirements are intended to minimize the impact of indoor and outdoor tire storage fires by regulating pile volume and

location, segregating the various operations, providing for fire department access and a water supply, and controlling ignition sources.

## **Chapter 35 Welding and Other Hot Work**

Chapter 35 covers requirements for safety in welding and other types of hot work by reducing the potential for fire ignitions that often result in large losses. Several different types of hot work would fall under the requirements found in Chapter 35, including both gas and electric arc methods and any open-torch operations. Many of the activities of this chapter focus on the actions of the occupants.

## **Chapter 36 Marinas**

Chapter 36 addresses the fire protection and prevention requirements for marinas. It was developed in response to the complications encountered by a number of fire departments responsible for the protection of marinas as well as fire loss history in marinas that lacked fire protection. Compliance with this chapter intends to establish safe practices in marina areas, provide an identification method for mooring spaces in the marina, and provide fire fighters with safe operational areas and fire protection methods to extend hose lines in a safe manner.

## **Chapter 37 Combustible Fibers**

Chapter 37 establishes the requirements for storage and handling of combustible fibers, including animal, vegetable and synthetic fibers, whether woven into textiles, baled, packaged or loose. Operations involving combustible fibers are typically associated with salvage, paper milling, recycling, cloth manufacturing, carpet and textile mills and agricultural operations, among others. The primary hazard associated with these operations is the abundance of materials and their ready ignitability.

## **Chapter 38 Higher Education Laboratories**

Chapter 38 is a chapter addressing the unique needs of laboratories in higher education academic institutions. The advancement of technologies, science, medicine and our knowledge of the world often relies on having vibrant and successful academic institutions. These academic institutions often have chemistry, biology, medical, engineering and other laboratories where hazardous materials are used. This chapter addresses both new and existing buildings and new and existing laboratories. Applying the general hazardous material provisions has proven to be difficult due to the way in which these laboratories operate. This chapter offers unique solutions for laboratories that allow the necessary quantities of hazardous materials while not requiring a Group H occupancy classification. This is achieved through a series of requirements to protect and separate the hazards, thus reducing risks. This chapter also provides more flexibility for laboratories in existing buildings by allowing the use of certain materials typically prohibited through method, such as the use of storage cabinets or fume hoods.

## **Chapter 39 Processing and Extraction Facilities**

Chapter 39 focuses on the processing and extraction of oils and fats from various plants. This process includes the extraction by use of solvent, desolventizing of the raw material and production of the miscella, and distillation of the solvent from the miscella and solvent recovery. The processes used are not necessarily typical hazardous material processes and often the systems and equipment associated with such processes are not listed. This chapter provides the tools to appropriately enforce the IFC to meet the unique needs of industry while providing the appropriate level of safety. This chapter has provisions for a technical report prepared by a registered design professional. This chapter also requires site inspections to make sure equipment and systems are installed as designed and approved.

## **Chapter 40 Storage of Distilled Spirits and Wines**

Chapter 40 is a new chapter that provides specific requirements for the storage of distilled spirits and wines. This chapter provides a package of safety requirements to address the unique hazards associ-



ated with the storage of distilled spirits and wines, including basic fire prevention requirements, fire protection features, storage configuration and signage. Additionally, in accordance with Section 307.1.1 of the IBC, these occupancies are not classified as a Group H occupancy. Instead, as listed in Sections 311.2 and 311.3 of the IBC, the storage of beverages that contain up to and including 16-percent alcohol are classified as a Group S-2 occupancy, and those that contain over 16-percent alcohol content are classified as a Group S-1 occupancy.

## **Chapters 41 through 48**

Reserved for future use.

## **Chapters 49—Fixed Guideway Transit and Passenger Rail Systems**

Chapter 49 contains Washington State amendments to NFPA 130.

## **PART V—HAZARDOUS MATERIALS**

### **Chapter 50 Hazardous Materials—General Provisions**

Chapter 50 contains the general requirements for all hazardous chemicals in all occupancies. Hazardous chemicals are defined as those that pose an unreasonable risk to the health and safety of operating or emergency personnel, the public and the environment if not properly controlled during handling, storage, manufacture, processing, packaging, use, disposal or transportation. The general provisions of this chapter are intended to be companion provisions with the specific requirements of Chapters 51 through 67 regarding a given hazardous material.

### **Chapter 51 Aerosols**

Chapter 51 addresses the prevention, control and extinguishment of fires and explosions in facilities where retail aerosol products are displayed or stored. It is concerned with both life safety and property protection from a fire; however, historically, aerosol product fires have caused property loss more frequently than loss of life. Requirements for storing aerosol products are dependent on the level of aerosol product, level of sprinkler protection, type of storage condition and quantity of aerosol products.

### **Chapter 52**

Reserved for future use.

### **Chapter 53 Compressed Gases**

Chapter 53 regulates the storage, use and handling of all flammable and nonflammable compressed gases, such as those that are used in medical facilities, air separation plants, industrial plants, agricultural equipment facilities and similar occupancies. In addition, systems such as carbon dioxide beverage dispensing systems and carbon dioxide enrichment systems are addressed. Standards for the design, construction and marking of compressed gas cylinders and pressure vessels are referenced. Compressed gases used in welding and cutting, cryogenic liquids and liquefied petroleum gases are also regulated under Chapters 35, 55 and 61, respectively. Compressed gases that are classified as hazardous materials are also regulated in Chapter 50, which includes general requirements.

### **Chapter 54 Corrosive Materials**

Chapter 54 addresses the hazards of corrosive materials that have a destructive effect on living tissues. Although corrosive gases exist, most corrosive materials are solid or liquid and classified as

either acids or bases (alkalis). These materials may pose a wide range of hazards other than corrosivity, such as combustibility, reactivity or oxidizing hazards, and must conform to the requirements of this code with respect to all known hazards. The focus of this chapter is on materials whose primary hazard is corrosivity; that is, the ability to destroy or irreparably damage living tissue on contact.

## **Chapter 55 Cryogenic Fluids**

Chapter 55 regulates the hazards associated with the storage, use and handling of cryogenic fluids through regulation of such things as pressure relief mechanisms and proper container storage. These hazards are in addition to the code requirements that address the other hazards of cryogenic fluids such as flammability and toxicity. These other characteristics are dealt with in Chapter 50 and other chapters, such as Chapter 58 dealing with flammable gases. Cryogenics are hazardous because they are held at extremely low temperatures and high pressures. Many cryogenic fluids, however, are actually inert gases and would not be regulated elsewhere in this code. Cryogenics are used for many applications but specifically have had widespread use in the biomedical field and in space programs.

## **Chapter 56 Explosives and Fireworks**

Chapter 56 prescribes minimum requirements for the safe manufacture, storage, handling and use of explosives, ammunition and blasting agents for commercial and industrial occupancies. These provisions are intended to protect the general public, emergency responders and individuals who handle explosives. Chapter 56 also regulates the manufacturing, retail sale, display and wholesale distribution of fireworks, establishing the requirements for obtaining approval to manufacture, store, sell, discharge or conduct a public display, and references national standards for regulations governing manufacture, storage and public displays.

## **Chapter 57 Flammable and Combustible Liquids**

The requirements of Chapter 57 are intended to reduce the likelihood of fires involving the storage, handling, use or transportation of flammable and combustible liquids. Adherence to these practices may also limit damage in the event of an accidental fire involving these materials. These liquids are used for fuel, lubricants, cleaners, solvents, medicine and even drinking. The danger associated with flammable and combustible liquids is that the vapors from these liquids, when combined with air in their flammable range, will burn or explode at temperatures near normal living and working environment. The protection provided by this code is to prevent the flammable and combustible liquids from being ignited.

## **Chapter 58 Flammable Gases and Flammable Cryogenic Fluids**

Chapter 58 sets requirements for the storage and use of flammable gases. For safety purposes, there is a limit on the quantities of flammable gas allowed per control area. Exceeding these limitations increases the possibility of damage to both property and individuals. The principal hazard posed by flammable gas is its ready ignitability, or even explosivity, when mixed with air in the proper proportions. Consequently, occupancies storing or handling large quantities of flammable gas are classified as Group H- 2 (high hazard) by the *IBC*.

## **Chapter 59 Flammable Solids**

Chapter 59 addresses general requirements for storage and handling of flammable solids, especially magnesium; however, it is important to note that several other solid materials, primarily metals including, but not limited to, titanium, zirconium, hafnium, calcium, zinc, sodium, lithium, potassium, sodium/potassium alloys, uranium, thorium and plutonium, can be explosion hazards under the right conditions. Some of these metals are almost exclusively laboratory materials but because of where they are used, fire service personnel must be trained to handle emergency situations. Because uranium, thorium and plutonium are also radioactive materials, they present still more specialized problems for fire service personnel.

## **Chapter 60 Highly Toxic and Toxic Materials**

The main purpose of Chapter 60 is to protect occupants, emergency responders and those in the immediate area of the building and facility from short-term, acute hazards associated with a release or general exposure to toxic and highly toxic materials. This chapter deals with all three states of toxic and highly toxic materials: solids, liquids and gases. This code does not address long-term exposure effects of these materials, which are addressed by agencies such as the Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA).

## **Chapter 61 Liquefied Petroleum Gases**

Chapter 61 establishes requirements for the safe handling, storing and use of LP-gas to reduce the possibility of damage to containers, accidental releases of LP-gas and exposure of flammable concentrations of LP-gas to ignition sources. LP-gas (notably propane) is well known as a camping fuel for cooking, lighting, heating and refrigerating and also remains a popular standby fuel supply for auxiliary generators as well as being widely used as an alternative motor vehicle fuel. Its characteristic as a clean-burning fuel has resulted in the addition of propane dispensers to service stations throughout the country.

## **Chapter 62 Organic Peroxides**

Chapter 62 addresses the hazards associated with the storage, handling and use of organic peroxides and intends to manage the fire and oxidation hazards of organic peroxides by preventing their uncontrolled release. These chemicals possess the characteristics of flammable or combustible liquids and are also strong oxidizers. This unusual combination of properties requires special storage and handling precautions to prevent uncontrolled release, contamination, hazardous chemical reactions, fires or explosions. The requirements of this chapter pertain to industrial applications in which significant quantities of organic peroxides are stored or used; however, smaller quantities of organic peroxides still pose a significant hazard and, therefore, must be stored and used in accordance with the applicable provisions of this chapter and Chapter 50.

## **Chapter 63 Oxidizers, Oxidizing Gases and Oxidizing Cryogenic Fluids**

Chapter 63 addresses the hazards associated with solid, liquid, gaseous and cryogenic fluid oxidizing materials, including oxygen in home use, and establishes criteria for their safe storage and protection in indoor and outdoor storage facilities, minimizing the potential for uncontrolled releases and contact with fuel sources. Although oxidizers themselves do not burn, they pose unique fire hazards because of their ability to support combustion by breaking down and giving off oxygen.

## **Chapter 64 Pyrophoric Materials**

Chapter 64 regulates the hazards associated with pyrophoric materials, which are capable of spontaneously igniting in the air at or below a temperature of 130°F (54°C). Many pyrophoric materials also pose severe flammability or reactivity hazards. This chapter addresses only the hazards associated with pyrophoric materials. Materials that pose multiple hazards must conform to the requirements of the code with respect to all hazards.

## **Chapter 65 Pyroxylin (Cellulose Nitrate) Plastics**

Chapter 65 addresses the significant hazards associated with pyroxylin (cellulose nitrate) plastics, which are the most dangerous and unstable of all plastic compounds. The chemically bound oxygen in their structure permits them to burn vigorously in the absence of atmospheric oxygen at a rate 15 times greater than comparable common combustibles. Strict compliance with the provisions of this chapter, along with proper housekeeping and storage arrangements, helps to reduce the hazards associated with pyroxylin (cellulose nitrate) plastics in a fire or other emergencies.

## **Chapter 66 Unstable (Reactive) Materials**

Chapter 66 addresses the hazards of unstable (reactive) liquid and solid materials as well as unstable (reactive) compressed gases. In addition to their unstable reactivity, these materials may pose other hazards, such as toxicity, corrosivity, explosivity, flammability or oxidizing potential. This chapter, however, intends to address those materials whose primary hazard is unstable reactivity. Materials that pose multiple hazards must conform to the requirements of the code with respect to all hazards. Strict compliance with the provisions of this chapter, along with proper housekeeping and storage arrangements, help reduce the exposure hazards associated with unstable (reactive) materials in a fire or other emergency.

## **Chapter 67 Water-reactive Solids and Liquids**

Chapter 67 addresses the hazards associated with water-reactive materials that are solid or liquid at normal temperatures and pressures. In addition to their water reactivity, these materials may pose a wide range of other hazards, such as toxicity, flammability, corrosiveness or oxidizing potential. This chapter addresses only those materials whose primary hazard is water reactivity. Materials that pose multiple hazards must conform to the requirements of the code with respect to all hazards. Strict compliance with the requirements of this chapter, along with proper housekeeping and storage arrangements, helps to reduce the exposure hazards associated with water-reactive materials in a fire or other emergency.

## **Chapters 68 through 79**

Reserved for future use.

## **PART VI—REFERENCED STANDARDS**

### **Chapter 80 Referenced Standards**

This code contains several references to standards that are used to regulate materials and methods of construction. Chapter 80 contains a comprehensive list of all standards that are referenced in this code. The standards are part of the code to the extent of the reference to the standard (see Section 102.7). 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 this 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 80 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, and the section or sections of this code that reference the standard.

## **PART VII—APPENDICES**

### **Appendix A Board of Appeals**

Appendix A contains optional criteria that, when adopted, provide jurisdictions with detailed appeals, board member qualifications and administrative procedures to supplement the basic requirements found in Section 111 of this code. Note that the provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

## **Appendix B Fire-flow Requirements for Buildings**

Appendix B provides a tool for the use of jurisdictions in establishing a policy for determining fire-flow requirements in accordance with Section 507.3. The determination of required fire flow is not an exact science, but having some level of information provides a consistent way of choosing the appropriate fire flow for buildings throughout a jurisdiction. The primary tool used in this appendix is a table that presents fire flow based on construction type and building area based on the correlation of the Insurance Services Office (ISO) method and the construction types used in the *IBC*. Note that the provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

## **Appendix C Fire Hydrant Locations and Distribution**

Appendix C focuses on the location and spacing of fire hydrants, which is important to the success of fire-fighting operations. The difficulty with determining the spacing of fire hydrants is that every situation is unique and has unique challenges. Finding one methodology for determining hydrant spacing is difficult. This particular appendix gives one methodology based on the required fire flow that fire departments can work with to set a policy for hydrant distribution around new buildings and facilities in conjunction with Section 507.5. Note that the provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

## **Appendix D Fire Apparatus Access Roads**

Appendix D contains more detailed elements for use with the basic access requirements found in Section 503, which gives some minimum criteria, such as a maximum length of 150 feet and a minimum width of 20 feet, but in many cases does not state specific criteria. This appendix, like Appendices B and C, is a tool for jurisdictions looking for guidance in establishing access requirements and includes criteria for multiple-family residential developments, large one- and two-family subdivisions, specific examples for various types of turnarounds for fire department apparatus and parking regulatory signage. Note that the provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

## **Appendix E Hazard Categories**

Appendix E contains guidance for designers, engineers, architects, code officials, plans reviewers and inspectors in the classifying of hazardous materials so that proposed designs can be evaluated intelligently and accurately. The descriptive materials and explanations of hazardous materials and how to report and evaluate them on a Safety Data Sheet (SDS) are intended to be instructional as well as informative. Note that this appendix is for information purposes and is not intended for adoption.

## **Appendix F Hazard Ranking**

The information in Appendix F is intended to be a companion to the specific requirements of Chapters 51 through 67, which regulate the storage, handling and use of all hazardous materials classified as either physical or health hazards. These materials pose diverse hazards, including instability, reactivity, flammability, oxidizing potential or toxicity; therefore, identifying them by hazard ranking is essential. This appendix lists the various hazardous materials categories that are defined in this code, along with the NFPA 704 hazard ranking for each. Note that the provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

## **Appendix G Cryogenic Fluids—Weight and Volume Equivalent**

Appendix G gives the fire code official and design professional a ready reference tool for the conversion of the liquid weight and volume of cryogenic fluid to their corresponding volume of gas and vice versa and is a companion to the provisions of Chapter 55 of this code. Note that this appendix is for information purposes and is not intended for adoption.

## **Appendix H Hazardous Materials Management Plan (HMMP) and Hazardous Materials Inventory Statement (HMIS) Instructions**

Appendix H is intended to assist businesses in establishing a Hazardous Materials Management Plan (HMMP) and Hazardous Materials Inventory Statement (HMIS) based on the classification and quantities of materials that would be found on-site, in storage or in use. The sample forms and available Safety Data Sheets (SDS) provide the basis for the evaluations. It is also a companion to IFC Sections 407.5 and 407.6, which provide the requirement that the HMIS and HMMP be submitted when required by the fire code official. Note that the provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

## **Appendix I Fire Protection Systems—Noncompliant Conditions**

The purpose of Appendix I, which was developed by the ICC Hazard Abatement in Existing Buildings Committee, is to provide the fire code official with a list of conditions that are readily identifiable by the inspector during the course of an inspection utilizing the IFC. The specific conditions identified in this appendix are primarily derived from applicable NFPA standards and pose a hazard to the proper operation of the respective systems. While these do not represent all of the conditions that pose a hazard or otherwise may impair the proper operation of fire protection systems, their identification in this adoptable appendix will provide a more direct path for enforcement by the fire code official. Note that the provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

## **Appendix J Building Information Sign**

Appendix J provides design, installation and maintenance requirements for a Building Information Sign (BIS), a fire service tool to be utilized in the crucial, initial response of fire fighters to a structure fire. The BIS placard is designed to be utilized within the initial response time frame of an incident to assist fire fighters in their tactical size-up of a situation as soon as possible after arrival on the scene of a fire emergency. The BIS design is in the shape of a fire service Maltese Cross and includes five spaces (the four wings plus the centerpiece of the cross symbol) in which information is placed about the tactical considerations of construction type and hourly rating, fire protection systems, occupancy type, content hazards and special features that could affect tactical decisions and operations. Note that the provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

## **Appendix K Construction Requirements for Existing Ambulatory Care Facilities**

Appendix K was created by the ICC Ad Hoc Committee on Healthcare (AHC) and its intent is to provide jurisdictions with an option for assessing minimum fire and life safety requirements for buildings containing ambulatory care facilities. While this appendix is written with the intent to apply retroactive minimum standards, the AHC recognized that the ambulatory care requirements are relatively recent additions to the *IBC*. For that reason, these requirements are presented as an appendix so that the adopting authority can exercise judgment in the adoption and application of this section. This appendix would also be useful for those local and state jurisdictions that are specifically focused on ensuring the safety for existing ambulatory care facilities by providing minimum criteria that could be used to bring older facilities into compliance with the current standards at the discretion of the adopting jurisdiction. The technical requirements are based on the current *IBC* language, which is consistent with the overall concept of the current federal requirements. Note that the provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

## **Appendix L Requirements for Fire Fighter Air Replenishment Systems**

Appendix L provides for the design, installation and maintenance of permanently installed fire fighter breathing air systems in buildings designated by the jurisdiction. Breathing air is critical for fire-fighting operations. Historically, fire departments have supplied air bottles by means of a “bottle brigade,” whereby fire fighters manually transport air bottles up stairways, which is an extraordinarily fire fighter-intensive process and takes fire fighters away from their primary mission of rescue and fire fighting. Technology now exists to address the issue using in-building air supply systems. Fire fighter

breathing air systems were introduced in the late 1980s and are now required in a number of communities throughout the United States. The system has been called a “standpipe for air” and consists of stainless steel, high-pressure piping that is supplied by on-site air storage or fire department air supply units. Air-filling stations are then strategically located throughout the building, allowing fire fighters to refill breathing air cylinders inside the fire building, negating the required “bottle brigade,” and making more fire fighters available for search, rescue and fire suppression operations. Note that the provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

## **Appendix M High-rise Buildings—Retroactive Automatic Sprinkler Requirement**

Appendix M was created with the intent to provide an option for adoption by jurisdictions that choose to require existing high-rise buildings to be retrofitted with automatic sprinklers. Modern fire and building codes require complete automatic fire sprinkler protection and a variety of other safety features in new high-rise construction. Many older high-rise buildings lack automatic sprinkler protection and other basic fire protection features necessary to protect the occupants, emergency responders and the structure itself. Without complete automatic sprinkler protection, fire departments cannot provide the level of protection that high-rise buildings demand. Existing high-rise buildings that are not protected with automatic sprinklers represent a significant hazard to occupants and fire fighters, and can significantly impact a community’s infrastructure and economic viability in the event of a fire loss. Note that the provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

## **Appendix N Indoor Trade Shows and Exhibitions**

Appendix N was created to address the hazards that are associated with larger, more complex trade shows and exhibitions. Although many of these requirements are already included in various locations in this code, some of the more important items, such as requirements for covered booths and multiple-story booths, are not. The intent is to have the requirements covering these events in a single location. The provisions are essentially a series of pointers to other locations within this code. This assists those organizing exhibitions and individual exhibitors unfamiliar with the fire code. The appendix can be adopted by jurisdictions looking for specific regulations on this subject or used as a guide where it is not. Note that the provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

# TABLE OF CONTENTS

|  |            |   |            |
|--|------------|---|------------|
| <i>Part I—Administrative</i> . . . . .                     | <i>1-1</i> | 304 Combustible Waste Material . . . . .  | 3-2        |
| <b>CHAPTER 1 SCOPE AND ADMINISTRATION</b> ..               | <b>1-1</b> | 305 Ignition Sources. . . . .   | 3-2        |
| <b>PART 1—GENERAL PROVISIONS</b> . . . . .                 | <b>1-1</b> | 306 Motion Picture Projection Rooms and Film . . . . .                            | 3-3        |
| Section  |            | 307 Open Burning, Recreational Fires<br>and Portable Outdoor Fireplaces . . . . . | 3-3        |
| WAC 51-54A-001 Authority . . . . .                         | 1-1        | 308 Open Flames . . . . .   | 3-3        |
| WAC 51-54A-002 Purpose . . . . .                           | 1-1        | 309 Powered Industrial Trucks and Equipment . . . . .                             | 3-5        |
| WAC 51-54A-003 International Fire Code . . . . .           | 1-1        | 310 Smoking. . . . .  | 3-6        |
| WAC 51-54A-007 Exceptions. . . . .                         | 1-1        | 311 Vacant Premises . . . . .   | 3-6        |
| WAC 51-54A-008 Implementation . . . . .                    | 1-1        | 312 Vehicle Impact Protection. . . . .  | 3-7        |
| 101 Scope and General Requirements . . . . .               | 1-2        | 313 Fueled Equipment . . . . .  | 3-8        |
| 102 Applicability . . . . .                                | 1-2        | 314 Indoor Displays . . . . .   | 3-8        |
| <b>PART 2—ADMINISTRATION AND<br/>ENFORCEMENT</b> . . . . . | <b>1-3</b> | 315 General Storage. . . . .  | 3-8        |
| Section  |            | 316 Hazards to Fire Fighters . . . . .  | 3-10       |
| 103 Code Compliance Agency . . . . .                       | 1-3        | 317 Landscaped Roofs . . . . .  | 3-11       |
| 104 Duties and Powers of the Fire Code Official. . . . .   | 1-3        | 318 Laundry Carts . . . . .   | 3-11       |
| 105 Permits . . . . .                                      | 1-5        | 319 Mobile Food Preparation Vehicles . . . . .                                    | 3-12       |
| 106 Construction Documents . . . . .                       | 1-13       | 320 Additive Manufacturing (3D Printing) . . . . .                                | 3-13       |
| 107 Fees . . . . .   | 1-13       | 321 Artificial Combustible Vegetation . . . . .                                   | 3-14       |
| 108 Inspections . . . . .                                  | 1-14       | 322 Lithium Batteries. . . . .  | 3-14       |
| 109 Maintenance. . . . .                                   | 1-14       | 323 Powered Micromobility Devices and Powered<br>Industrial Trucks . . . . .      | 3-16       |
| 110 Service Utilities . . . . .                            | 1-15       | <b>CHAPTER 4 EMERGENCY PLANNING<br/>AND PREPAREDNESS</b> . . . . .                | <b>4-1</b> |
| 111 Means of Appeals . . . . .                             | 1-15       | Section   |            |
| 112 Violations. . . . .                                    | 1-15       | 401 General . . . . .   | 4-1        |
| 113 Stop Work Order . . . . .                              | 1-16       | 402 Definitions . . . . .   | 4-1        |
| 114 Unsafe Structures or Equipment . . . . .               | 1-16       | 403 Emergency Preparedness Requirements . . . . .                                 | 4-1        |
| <b>CHAPTER 2 DEFINITIONS</b> . . . . .                     | <b>2-1</b> | 404 Fire Safety, Evacuation and Lockdown Plans. . . . .                           | 4-6        |
| Section  |            | 405 Emergency Evacuation Drills . . . . .   | 4-7        |
| 201 General. . . . .                                       | 2-1        | 406 Employee Training and Response Procedures . . . . .                           | 4-9        |
| 202 General Definitions . . . . .                          | 2-1        | 407 Hazard Communication. . . . .   | 4-9        |
| <i>Part II—General Safety Provisions</i> . . . . .         | <i>3-1</i> | <i>Part III—Building and Equipment Design Features</i> ..                         | <i>5-1</i> |
| <b>CHAPTER 3 GENERAL REQUIREMENTS</b> . . . . .            | <b>3-1</b> | <b>CHAPTER 5 FIRE SERVICE FEATURES.</b> . . . . .                                 | <b>5-1</b> |
| Section  |            | Section   |            |
| 301 General. . . . .                                       | 3-1        | 501 General . . . . .   | 5-1        |
| 302 Definitions . . . . .                                  | 3-1        | 502 Definitions . . . . .   | 5-1        |
| 303 Asphalt Kettles. . . . .                               | 3-1        | 503 Fire Apparatus Access Roads . . . . .   | 5-1        |
|  |            | 504 Access to Building Openings and Roofs. . . . .                                | 5-2        |



**TABLE OF CONTENTS**

505 Premises Identification . . . . . 5-2  
506 Key Boxes . . . . . 5-2  
507 Fire Protection Water Supplies . . . . . 5-3  
508 Fire Command Center . . . . . 5-3  
509 Fire Protection and Utility Equipment  
Identification and Access. . . . . 5-5  
510 Emergency Responder Communication  
Coverage . . . . . 5-5

**CHAPTER 6 BUILDING SERVICES  
AND SYSTEMS . . . . . 6-1**

Section

601 General. . . . . 6-1  
602 Definitions . . . . . 6-1  
603 Electrical Equipment, Wiring and Hazards . . . . . 6-1  
604 Elevator Operation, Maintenance  
and Fire Service Keys . . . . . 6-3  
605 Fuel-Fired Appliances . . . . . 6-4  
606 Commercial Cooking Equipment and Systems . . . . . 6-7  
607 Commercial Cooking Oil Storage . . . . . 6-9  
608 Mechanical Refrigeration . . . . . 6-9  
609 Hyperbaric Facilities . . . . . 6-12  
610 Clothes Dryer Exhaust Systems . . . . . 6-12

**CHAPTER 7 FIRE AND SMOKE  
PROTECTION FEATURES. . . . . 7-1**

Section

701 General. . . . . 7-1  
702 Definitions . . . . . 7-1  
703 Penetrations . . . . . 7-1  
704 Joints and Voids. . . . . 7-2  
705 Door and Window Openings . . . . . 7-2  
706 Duct and Air Transfer Openings . . . . . 7-2  
707 Concealed Spaces . . . . . 7-3  
708 Spray Fire-Resistant Materials and  
Intumescent Fire-Resistant Materials . . . . . 7-3

**CHAPTER 8 INTERIOR FINISH,  
DECORATIVE MATERIALS  
AND FURNISHINGS . . . . . 8-1**

Section

801 General. . . . . 8-1  
802 Definitions . . . . . 8-1  
803 Interior Wall and Ceiling Finish

in Existing Buildings. . . . . 8-1  
804 Interior Wall and Ceiling Trim and  
Interior Floor Finish in New and  
Existing Buildings. . . . . 8-3  
805 Upholstered Furniture and Mattresses in  
New and Existing Buildings . . . . . 8-4  
806 Natural Decorative Vegetation in New and  
Existing Buildings. . . . . 8-7  
807 Decorative Materials and Artificial Decorative  
Vegetation in New and Existing Buildings. . . . . 8-8  
808 Furnishings Other than Upholstered  
Furniture and Mattresses or Decorative  
Materials in New and Existing Buildings . . . . . 8-10

**CHAPTER 9 FIRE PROTECTION AND  
LIFE SAFETY SYSTEMS . . . . . 9-1**

Section

901 General . . . . . 9-1  
902 Definitions. . . . . 9-4  
903 Automatic Sprinkler Systems . . . . . 9-4  
904 Alternative Automatic  
Fire-Extinguishing Systems . . . . . 9-13  
905 Standpipe Systems . . . . . 9-18  
906 Portable Fire Extinguishers. . . . . 9-20  
907 Fire Alarm and Detection Systems . . . . . 9-23  
908 Emergency Alarm Systems. . . . . 9-36  
909 Smoke Control Systems . . . . . 9-36  
910 Smoke and Heat Removal. . . . . 9-45  
911 Explosion Control . . . . . 9-47  
912 Fire Department Connections . . . . . 9-48  
913 Fire Pumps . . . . . 9-49  
914 Fire Protection Based on Special Detailed  
Requirements of Use and Occupancy . . . . . 9-50  
915 Carbon Monoxide Detection . . . . . 9-53  
916 Gas Detection Systems . . . . . 9-55  
917 Mass Notification Systems . . . . . 9-56

**CHAPTER 10 MEANS OF EGRESS . . . . . 10-1**

Section

1001 Administration . . . . . 10-1  
1002 Definitions . . . . . 10-1  
1003 General Means of Egress . . . . . 10-2  
1004 Occupant Load . . . . . 10-3  
1005 Means of Egress Sizing . . . . . 10-5

1006 Numbers of Exits and Exit Access Doorways . . 10-6  
 1007 Exit and Exit Access Doorway Configuration . . 10-9  
 1008 Means of Egress Illumination . . . . . 10-10  
 1009 Accessible Means of Egress . . . . . 10-11  
 1010 Doors, Gates and Turnstiles . . . . . 10-14  
 1011 Stairways . . . . . 10-24  
 1012 Ramps . . . . . 10-28  
 1013 Exit Signs . . . . . 10-29  
 1014 Handrails . . . . . 10-30  
 1015 Guards . . . . . 10-31  
 1016 Exit Access . . . . . 10-33  
 1017 Exit Access Travel Distance . . . . . 10-34  
 1018 Aisles . . . . . 10-35  
 1019 Exit Access Stairways and Ramps . . . . . 10-35  
 1020 Corridors . . . . . 10-36  
 1021 Egress Balconies . . . . . 10-38  
 1022 Exits . . . . . 10-38  
 1023 Interior Exit Stairways and Ramps . . . . . 10-38  
 1024 Exit Passageways . . . . . 10-41  
 1025 Luminous Egress Path Markings . . . . . 10-42  
 1026 Horizontal Exits . . . . . 10-43  
 1027 Exterior Exit Stairways and Ramps . . . . . 10-44  
 1028 Exit Discharge . . . . . 10-45  
 1029 Egress Courts . . . . . 10-45  
 1030 Assembly . . . . . 10-46  
 1031 Emergency Escape and Rescue . . . . . 10-53  
 1032 Maintenance of the Means of Egress . . . . . 10-54

**CHAPTER 11 CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS . . . . . 11-1**

Section  
 1101 General . . . . . 11-1  
 1102 Definitions . . . . . 11-1  
 1103 Fire Safety Requirements for Existing Buildings . . . . . 11-1  
 1104 Means of Egress for Existing Buildings . . . . . 11-9  
 1105 Construction Requirements for Existing Group I-2 . . . . . 11-14  
 1106 Requirements for Outdoor Operations . . . . . 11-18

**CHAPTER 12 ENERGY SYSTEMS . . . . . 12-1**

Section  
 1201 General . . . . . 12-1  
 1202 Definitions . . . . . 12-1

1203 Emergency and Standby Power Systems . . . . . 12-1  
 1204 Portable Generators . . . . . 12-3  
 1205 Solar Photovoltaic Power Systems . . . . . 12-4  
 1206 Stationary Fuel Cell Power Systems . . . . . 12-6  
 1207 Electrical Energy Storage Systems (ESS) . . . . . 12-8

**CHAPTERS 13 through 19 RESERVED . . . . . 13-19-1**

***Part IV—Special Occupancies and Operations. . . . . 20-1***

**CHAPTER 20 AVIATION FACILITIES . . . . . 20-1**

Section  
 2001 General . . . . . 20-1  
 2002 Definitions . . . . . 20-1  
 2003 General Precautions . . . . . 20-1  
 2004 Aircraft Maintenance . . . . . 20-1  
 2005 Portable Fire Extinguishers . . . . . 20-2  
 2006 Aircraft Fueling . . . . . 20-2  
 2007 Helistops and Heliports . . . . . 20-7

**CHAPTER 21 DRY CLEANING . . . . . 21-1**

Section  
 2101 General . . . . . 21-1  
 2102 Definitions . . . . . 21-1  
 2103 Classifications . . . . . 21-1  
 2104 General Requirements . . . . . 21-1  
 2105 Operating Requirements . . . . . 21-2  
 2106 Spotting and Pretreating . . . . . 21-2  
 2107 Dry Cleaning Systems . . . . . 21-3  
 2108 Fire Protection . . . . . 21-3

**CHAPTER 22 COMBUSTIBLE DUST-PRODUCING OPERATIONS . . . . . 22-1**

Section  
 2201 General . . . . . 22-1  
 2202 Definitions . . . . . 22-1  
 2203 Dust Explosion Prevention . . . . . 22-1  
 2204 Dust Explosion Screening Tests . . . . . 22-4  
 2205 Standards . . . . . 22-4

**CHAPTER 23 MOTOR FUEL-DISPENSING FACILITIES AND REPAIR GARAGES . . . . . 23-1**

Section  
 2301 General . . . . . 23-1  
 2302 Definitions . . . . . 23-1

**TABLE OF CONTENTS**

2303 Location of Dispensing Devices . . . . . 23-1  
2304 Dispensing Operations . . . . . 23-2  
2305 Operational Requirements . . . . . 23-3  
2306 Flammable and Combustible Liquid Motor  
Fuel-Dispensing Facilities . . . . . 23-4  
2307 Liquefied Petroleum Gas Motor  
Fuel-Dispensing Facilities . . . . . 23-8  
2308 Compressed Natural Gas Motor  
Fuel-Dispensing Facilities . . . . . 23-9  
2309 Hydrogen Motor Fuel-Dispensing  
and Generation Facilities . . . . . 23-11  
2310 Marine Motor Fuel-Dispensing Facilities. . . . 23-13  
2311 Repair Garages . . . . . 23-14

**CHAPTER 24 FLAMMABLE FINISHES . . . . . 24-1**

Section

2401 General . . . . . 24-1  
2402 Definitions . . . . . 24-1  
2403 Protection of Operations. . . . . 24-1  
2404 Spray Finishing. . . . . 24-3  
2405 Dipping Operations. . . . . 24-7  
2406 Powder Coating . . . . . 24-8  
2407 Electrostatic Apparatus. . . . . 24-9  
2408 Organic Peroxides and  
Dual-Component Coatings . . . . . 24-10  
2409 Indoor Manufacturing of  
Reinforced Plastics . . . . . 24-10  
2410 Floor Surfacing and Finishing Operations . . . 24-11

**CHAPTER 25 FRUIT AND CROP RIPENING. . . 25-1**

Section

2501 General . . . . . 25-1  
2502 Definitions . . . . . 25-1  
2503 Ethylene Gas. . . . . 25-1  
2504 Sources of Ignition . . . . . 25-1  
2505 Combustible Waste. . . . . 25-1  
2506 Ethylene Generators . . . . . 25-1  
2507 Warning Signs . . . . . 25-1

**CHAPTER 26 FUMIGATION AND  
INSECTICIDAL FOGGING . . . . . 26-1**

Section

2601 General . . . . . 26-1  
2602 Definitions . . . . . 26-1  
2603 Fire Safety Requirements . . . . . 26-1

**CHAPTER 27 SEMICONDUCTOR  
FABRICATION FACILITIES. . . . .27-1**

Section

2701 General . . . . . 27-1  
2702 Definitions . . . . . 27-1  
2703 General Safety Provisions . . . . . 27-1  
2704 Storage . . . . . 27-5  
2705 Use and Handling. . . . . 27-6

**CHAPTER 28 LUMBER YARDS AND AGRO-  
INDUSTRIAL, SOLID BIOMASS  
AND WOODWORKING  
FACILITIES. . . . .28-1**

Section

2801 General . . . . . 28-1  
2802 Definitions . . . . . 28-1  
2803 General Requirements . . . . . 28-1  
2804 Fire Protection . . . . . 28-2  
2805 Plywood, Veneer and Composite  
Board Mills. . . . . 28-2  
2806 Log Storage Areas . . . . . 28-2  
2807 Storage of Wood Chips and Hogged Materials  
Associated with Timber and Lumber  
Production Facilities. . . . . 28-2  
2808 Storage and Processing of Wood Chips,  
Hogged Materials, Fines, Compost,  
Solid Biomass Feedstock and Raw Product  
Associated with Yard Waste,  
Agro-Industrial and Recycling Facilities . . . . 28-3  
2809 Exterior Storage of Finished  
Lumber and Solid Biofuel Products . . . . . 28-3  
2810 Outdoor Storage of Pallets at Pallet Manufacturing  
and Recycling Facilities. . . . . 28-4

**CHAPTER 29 MANUFACTURE OF  
ORGANIC COATINGS . . . . .29-1**

Section

2901 General . . . . . 29-1  
2902 Definition . . . . . 29-1  
2903 General Precautions . . . . . 29-1  
2904 Electrical Equipment and Protection . . . . . 29-1  
2905 Process Structures . . . . . 29-2  
2906 Process Mills and Kettles. . . . . 29-2  
2907 Process Piping . . . . . 29-2  
2908 Raw Materials in Process Areas. . . . . 29-3  
2909 Raw Materials and Finished Products . . . . . 29-3

|   |             |  |             |
|---|-------------|--|-------------|
| <b>CHAPTER 30 INDUSTRIAL OVENS . . . . .</b>  | <b>30-1</b> | 3304 Protection of Combustible Materials . . . . .                                 | 33-3        |
| Section   |             | 3305 Ignition Source Controls . . . . .  | 33-3        |
| 3001 General . . . . .  | 30-1        | 3306 Fire Protection Systems and Devices . . . . .                                 | 33-4        |
| 3002 Definitions . . . . .  | 30-1        | 3307 Fire Department Site Access<br>and Water Supply . . . . .                     | 33-4        |
| 3003 Location . . . . .   | 30-1        | 3308 Motorized Construction Equipment . . . . .                                    | 33-5        |
| 3004 Fuel Piping . . . . .  | 30-1        | 3309 Hazardous Materials . . . . .   | 33-5        |
| 3005 Interlocks . . . . .   | 30-1        | 3310 Additional Safeguards<br>for Occupied Buildings . . . . .                     | 33-6        |
| 3006 Fire Protection . . . . .  | 30-1        | 3311 Additional Safeguards for Type I<br>and II Construction . . . . .             | 33-6        |
| 3007 Operation and Maintenance . . . . .  | 30-2        | 3312 Additional Safeguards for Type IV-A, IV-B,<br>and IV-C Construction . . . . . | 33-6        |
| <br>  |             | 3313 Water Supply for Fire Protection (Deleted) . . . . .                          | 33-7        |
| <b>CHAPTER 31 TENTS, TEMPORARY SPECIAL<br/>EVENT STRUCTURES AND OTHER<br/>MEMBRANE STRUCTURES . . . . .</b> | <b>31-1</b> | 3314 Standpipes (Deleted) . . . . .  | 33-7        |
| Section   |             | 3315 Automatic Sprinkler System (Deleted) . . . . .                                | 33-7        |
| 3101 General . . . . .  | 31-1        | 3316 Portable Fire Extinguishers (Deleted) . . . . .                               | 33-7        |
| 3102 Definitions . . . . .  | 31-1        | 3317 Motorized Construction Equipment (Deleted) . . . . .                          | 33-7        |
| 3103 Temporary Tents and Membrane Structures . . . . .  | 31-1        | 3318 Safeguarding Roofing Operations (Deleted) . . . . .                           | 33-7        |
| 3104 Temporary and Permanent Tents<br>and Membrane Structures . . . . .                                     | 31-4        |  |             |
| 3105 Temporary Special Event Structures . . . . .   | 31-4        |  |             |
| 3106 Outdoor Assembly Events . . . . .  | 31-5        |  |             |
| 3107 Operational Requirements . . . . .   | 31-6        |  |             |
| <br>  |             | <b>CHAPTER 34 TIRE REBUILDING<br/>AND TIRE STORAGE . . . . .</b>                   | <b>34-1</b> |
| <b>CHAPTER 32 HIGH-PILED<br/>COMBUSTIBLE STORAGE . . . . .</b>  | <b>32-1</b> | Section  |             |
| Section   |             | 3401 General . . . . .   | 34-1        |
| 3201 General . . . . .  | 32-1        | 3402 Definitions . . . . .   | 34-1        |
| 3202 Definitions . . . . .  | 32-2        | 3403 Tire Rebuilding . . . . .   | 34-1        |
| 3203 Commodity Classification . . . . .   | 32-2        | 3404 Precautions Against Fire . . . . .  | 34-1        |
| 3204 Designation of High-Piled Storage Areas . . . . .  | 32-11       | 3405 Outdoor Storage . . . . .   | 34-1        |
| 3205 Housekeeping and Maintenance . . . . .   | 32-12       | 3406 Fire Department Access . . . . .  | 34-2        |
| 3206 General Fire Protection and<br>Life Safety Features . . . . .  | 32-12       | 3407 Fencing . . . . .   | 34-2        |
| 3207 Solid-Piled and Shelf Storage . . . . .  | 32-15       | 3408 Fire Protection . . . . .   | 34-2        |
| 3208 Rack Storage . . . . .   | 32-15       | 3409 Indoor Storage Arrangement . . . . .  | 34-2        |
| 3209 Automated Storage . . . . .  | 32-16       |  |             |
| 3210 Specialty Storage . . . . .  | 32-17       | <b>CHAPTER 35 WELDING AND<br/>OTHER HOT WORK . . . . .</b>                         | <b>35-1</b> |
| <br>  |             | Section  |             |
| <b>CHAPTER 33 FIRE SAFETY DURING<br/>CONSTRUCTION AND<br/>DEMOLITION . . . . .</b>                          | <b>33-1</b> | 3501 General . . . . .   | 35-1        |
| Section   |             | 3502 Definitions . . . . .   | 35-1        |
| 3301 General . . . . .  | 33-1        | 3503 General Requirements . . . . .  | 35-1        |
| 3302 Definitions . . . . .  | 33-1        | 3504 Fire Safety Requirements . . . . .  | 35-1        |
| 3303 Administrative Safety Controls . . . . .   | 33-1        | 3505 Gas Welding and Cutting . . . . .   | 35-2        |
|   |             | 3506 Electric Arc Hot Work . . . . .   | 35-3        |
|   |             | 3507 Calcium Carbide Systems . . . . .   | 35-3        |
|   |             | 3508 Acetylene Generators . . . . .  | 35-3        |

**TABLE OF CONTENTS**

3509 Piping Manifolds and Hose Systems for Fuel Gases and Oxygen . . . . . 35-4  
3510 Hot Work on Flammable and Combustible Liquid Storage Tanks . . . . . 35-4

**CHAPTER 36 MARINAS . . . . . 36-1**

Section

3601 Scope . . . . . 36-1  
3602 Definitions . . . . . 36-1  
3603 General Precautions . . . . . 36-1  
3604 Fire Protection Equipment . . . . . 36-1  
3605 Marine Motor Fuel-Dispensing Facilities. . . . . 36-2

**CHAPTER 37 COMBUSTIBLE FIBERS . . . . . 37-1**

Section

3701 General . . . . . 37-1  
3702 Definitions . . . . . 37-1  
3703 General Precautions . . . . . 37-1  
3704 Loose Fiber Storage . . . . . 37-1  
3705 Baled Storage . . . . . 37-2

**CHAPTER 38 HIGHER EDUCATION LABORATORIES . . . . . 38-1**

Section

3801 General . . . . . 38-1  
3802 Definitions . . . . . 38-1  
3803 General Safety Provisions . . . . . 38-1  
3804 Laboratory Suite Construction . . . . . 38-2  
3805 Nonsprinklered Laboratories . . . . . 38-3  
3806 Existing Sprinklered Laboratories . . . . . 38-4

**CHAPTER 39 PROCESSING AND EXTRACTION FACILITIES . . . . . 39-1**

Section

3901 General . . . . . 39-1  
3902 Definitions . . . . . 39-1  
3903 Processing and Extraction . . . . . 39-1  
3904 Systems and Equipment . . . . . 39-1  
3905 Safety Systems . . . . . 39-2

**CHAPTER 40 STORAGE OF DISTILLED SPIRITS AND WINES . . . . . 40-1**

Section

4001 General. . . . . 40-1  
4002 Definitions . . . . . 40-1

4003 Precautions against Fire . . . . . 40-1  
4004 Storage. . . . . 40-2  
4005 Fire Protection. . . . . 40-2  
4006 Signage . . . . . 40-2

**CHAPTERS 41 through 48 RESERVED . . . . . 41-48-1**

**CHAPTER 49 FIXED GUIDEWAY TRANSIT AND PASSENGER RAIL SYSTEMS . . . . . 49-1**

Section

4901 Scope NFPA 130. . . . . 49-1

*Part V—Hazardous Materials . . . . . 50-1*

**CHAPTER 50 HAZARDOUS MATERIALS—GENERAL PROVISIONS . . . . . 50-1**

Section

5001 General . . . . . 50-1  
5002 Definitions . . . . . 50-4  
5003 General Requirements . . . . . 50-4  
5004 Storage . . . . . 50-19  
5005 Use, Dispensing and Handling. . . . . 50-22

**CHAPTER 51 AEROSOLS . . . . . 51-1**

Section

5101 General . . . . . 51-1  
5102 Definitions . . . . . 51-1  
5103 Classification of Aerosol Products. . . . . 51-1  
5104 Inside Storage of Aerosol Products . . . . . 51-1  
5105 Outside Storage . . . . . 51-4  
5106 Retail Display. . . . . 51-5  
5107 Manufacturing Facilities . . . . . 51-6

**CHAPTER 52 RESERVED . . . . . 52-1**

**CHAPTER 53 COMPRESSED GASES . . . . . 53-1**

Section

5301 General . . . . . 53-1  
5302 Definitions . . . . . 53-1  
5303 General Requirements . . . . . 53-1  
5304 Storage of Compressed Gases . . . . . 53-5  
5305 Use and Handling of Compressed Gases . . . . . 53-5  
5306 Medical Gases . . . . . 53-6  
5307 Compressed Gases Not Otherwise Regulated . . . . . 53-6

|   |   |
|---|---|
| <b>CHAPTER 54 CORROSIVE MATERIALS..... 54-1</b>   | <b>CHAPTER 58 FLAMMABLE GASES<br/>AND FLAMMABLE<br/>CRYOGENIC FLUIDS ..... 58-1</b> |
| Section   | Section   |
| 5401 General ..... 54-1   | 5801 General ..... 58-1   |
| 5402 Definition ..... 54-1  | 5802 Definitions ..... 58-1   |
| 5403 General Requirements ..... 54-1  | 5803 General Requirements ..... 58-1  |
| 5404 Storage ..... 54-1   | 5804 Storage ..... 58-2   |
| 5405 Use ..... 54-1   | 5805 Use ..... 58-2   |
| <b>CHAPTER 55 CRYOGENIC FLUIDS ..... 55-1</b>   | 5806 Flammable Cryogenic Fluids ..... 58-2  |
| Section   | 5807 Metal Hydride Storage Systems ..... 58-3                                       |
| 5501 General ..... 55-1   | 5808 Hydrogen Fuel Gas Rooms ..... 58-5   |
| 5502 Definitions ..... 55-1   | <b>CHAPTER 59 FLAMMABLE SOLIDS ..... 59-1</b>                                       |
| 5503 General Requirements ..... 55-1  | Section   |
| 5504 Storage ..... 55-3   | 5901 General ..... 59-1   |
| 5505 Use and Handling ..... 55-4  | 5902 Definitions ..... 59-1   |
| <b>CHAPTER 56 EXPLOSIVES<br/>AND FIREWORKS ..... 56-1</b>   | 5903 General Requirements ..... 59-1  |
| Section   | 5904 Storage ..... 59-1   |
| 5601 General ..... 56-1   | 5905 Use ..... 59-1   |
| 5602 Definitions ..... 56-4   | 5906 Magnesium ..... 59-1   |
| 5603 Record Keeping and Reporting ..... 56-5  | <b>CHAPTER 60 HIGHLY TOXIC AND<br/>TOXIC MATERIALS ..... 60-1</b>                   |
| 5604 Explosive Materials Storage and Handling .... 56-5   | Section   |
| 5605 Manufacture, Assembly and Testing of<br>Explosives, Explosive Materials and<br>Fireworks ..... 56-11 | 6001 General ..... 60-1   |
| 5606 Small Arms Ammunition and Small<br>Arms Ammunition Components ..... 56-14                            | 6002 Definitions ..... 60-1   |
| 5607 Blasting ..... 56-16   | 6003 Highly Toxic and Toxic Solids and Liquids ... 60-1                             |
| 5608 Fireworks Display ..... 56-17  | 6004 Highly Toxic and Toxic Compressed Gases ... 60-2                               |
| 5609 Temporary Storage of Consumer Fireworks .. 56-18   | 6005 Ozone Gas Generators ..... 60-7  |
| <b>CHAPTER 57 FLAMMABLE AND<br/>COMBUSTIBLE LIQUIDS..... 57-1</b>   | <b>CHAPTER 61 LIQUEFIED<br/>PETROLEUM GASES ..... 61-1</b>                          |
| Section   | Section   |
| 5701 General ..... 57-1   | 6101 General ..... 61-1   |
| 5702 Definitions ..... 57-1   | 6102 Definitions ..... 61-1   |
| 5703 General Requirements ..... 57-2  | 6103 Installation of Equipment ..... 61-1   |
| 5704 Storage ..... 57-6   | 6104 Location of LP-Gas Containers ..... 61-2                                       |
| 5705 Dispensing, Use, Mixing and Handling ..... 57-26   | 6105 Prohibited Use of LP-Gas ..... 61-2  |
| 5706 Special Operations ..... 57-32   | 6106 Dispensing and Overfilling ..... 61-2  |
| 5707 On-Demand Mobile Fueling Operations ..... 57-41  | 6107 Safety Precautions and Devices ..... 61-2                                      |
|   | 6108 Fire Protection ..... 61-3   |

**TABLE OF CONTENTS**

6109 Storage of Portable LP-Gas Containers  
Awaiting Use or Resale . . . . . 61-4  
6110 LP-Gas Containers Not in Service . . . . . 61-5  
6111 Parking and Garaging of  
LP-Gas Tank Vehicles . . . . . 61-5

**CHAPTER 62 ORGANIC PEROXIDES . . . . . 62-1**

Section  
6201 General . . . . . 62-1  
6202 Definition . . . . . 62-1  
6203 General Requirements . . . . . 62-1  
6204 Storage . . . . . 62-1  
6205 Use . . . . . 62-3

**CHAPTER 63 OXIDIZERS, OXIDIZING  
GASES AND OXIDIZING  
CRYOGENIC FLUIDS . . . . . 63-1**

Section  
6301 General . . . . . 63-1  
6302 Definitions . . . . . 63-1  
6303 General Requirements . . . . . 63-1  
6304 Storage . . . . . 63-2  
6305 Use . . . . . 63-4  
6306 Liquid Oxygen in Home Health Care . . . . . 63-4

**CHAPTER 64 PYROPHORIC MATERIALS . . . . 64-1**

Section  
6401 General . . . . . 64-1  
6402 Definition . . . . . 64-1  
6403 General Requirements . . . . . 64-1  
6404 Storage . . . . . 64-1  
6405 Use . . . . . 64-2

**CHAPTER 65 PYROXYLIN (CELLULOSE  
NITRATE) PLASTICS . . . . . 65-1**

Section  
6501 General . . . . . 65-1  
6502 Definitions . . . . . 65-1  
6503 General Requirements . . . . . 65-1  
6504 Storage and Handling . . . . . 65-1

**CHAPTER 66 UNSTABLE  
(REACTIVE) MATERIALS . . . . . 66-1**

Section  
6601 General . . . . . 66-1  
6602 Definition . . . . . 66-1

6603 General Requirements . . . . . 66-1  
6604 Storage . . . . . 66-2  
6605 Use . . . . . 66-2

**CHAPTER 67 WATER-REACTIVE  
SOLIDS AND LIQUIDS . . . . . 67-1**

Section  
6701 General . . . . . 67-1  
6702 Definition . . . . . 67-1  
6703 General Requirements . . . . . 67-1  
6704 Storage . . . . . 67-1  
6705 Use . . . . . 67-2

**CHAPTERS 68 through 79 RESERVED . . . . . 68-79-1**

*Part VI—Referenced Standards. . . . . 80-1*

**CHAPTER 80 REFERENCED STANDARDS. . . . 80-1**

*Part VII—Appendices. . . . . APPENDIX A-1*

**APPENDIX A BOARD OF  
APPEALS . . . . . APPENDIX A-1**

Section  
A101 General . . . . . APPENDIX A-1

**APPENDIX B FIRE-FLOW REQUIREMENTS  
FOR BUILDINGS . . . . APPENDIX B-1**

Section  
B101 General . . . . . APPENDIX B-1  
B102 Definitions . . . . . APPENDIX B-1  
B103 Modifications . . . . . APPENDIX B-1  
B104 Fire-Flow Calculation Area . . . . . APPENDIX B-1  
B105 Fire-Flow Requirements for  
Buildings . . . . . APPENDIX B-1  
B106 Referenced Standards . . . . . APPENDIX B-3

**APPENDIX C FIRE HYDRANT  
LOCATIONS AND  
DISTRIBUTION . . . . . APPENDIX C-1**

Section  
C101 General . . . . . APPENDIX C-1  
C102 Number of Fire Hydrants . . . . . APPENDIX C-1  
C103 Fire Hydrant Spacing . . . . . APPENDIX C-1  
C104 Consideration of Existing  
Fire Hydrants . . . . . APPENDIX C-2  
C105 Referenced Standard . . . . . APPENDIX C-2

**APPENDIX D FIRE APPARATUS**

**ACCESS ROADS . . . . . APPENDIX D-1**

Section

D101 General . . . . . APPENDIX D-1  
 D102 Required Access . . . . . APPENDIX D-1  
 D103 Minimum Specifications. . . . . APPENDIX D-1  
 D104 Commercial and Industrial  
     Developments . . . . . APPENDIX D-2  
 D105 Aerial Fire Apparatus  
     Access Roads . . . . . APPENDIX D-2  
 D106 Multiple-Family Residential  
     Developments . . . . . APPENDIX D-3  
 D107 One- or Two-Family Residential  
     Developments . . . . . APPENDIX D-3  
 D108 Referenced Standards . . . . . APPENDIX D-3

**APPENDIX E HAZARD**

**CATEGORIES . . . . . APPENDIX E-1**

Section

E101 General . . . . . APPENDIX E-1  
 E102 Hazard Categories. . . . . APPENDIX E-1  
 E103 Evaluation of Hazards. . . . . APPENDIX E-5  
 E104 Referenced Standards . . . . . APPENDIX E-6

**APPENDIX F HAZARD RANKING .. APPENDIX F-1**

Section

F101 General . . . . . APPENDIX F-1  
 F102 Referenced Standards . . . . . APPENDIX F-1

**APPENDIX G CRYOGENIC FLUIDS—  
 WEIGHT AND VOLUME**

**EQUIVALENTS. . . . . APPENDIX G-1**

Section

G101 General . . . . . APPENDIX G-1

**APPENDIX H HAZARDOUS MATERIALS  
 MANAGEMENT PLAN (HMMP)**

**AND HAZARDOUS MATERIALS  
 INVENTORY STATEMENT (HMIS)  
 INSTRUCTIONS . . . . . APPENDIX H-1**

Section

H101 HMMP . . . . . APPENDIX H-1  
 H102 HMIS . . . . . APPENDIX H-1  
 H103 Emergency Plan . . . . . APPENDIX H-2

H104 Security. . . . . APPENDIX H-2  
 H105 Referenced Standards. . . . . APPENDIX H-2

**APPENDIX I FIRE PROTECTION  
 SYSTEMS—NONCOMPLIANT  
 CONDITIONS . . . . . APPENDIX I-1**

Section

I101 Noncompliant Conditions. . . . . APPENDIX I-1  
 I102 Referenced Standards. . . . . APPENDIX I-2

**APPENDIX J BUILDING  
 INFORMATION  
 SIGN . . . . . APPENDIX J-1**

Section

J101 General . . . . . APPENDIX J-1  
 J102 Referenced Standards. . . . . APPENDIX J-3

**APPENDIX K CONSTRUCTION  
 REQUIREMENTS FOR  
 EXISTING AMBULATORY  
 CARE FACILITIES .. APPENDIX K-1**

Section

K101 General . . . . . APPENDIX K-1  
 K102 Fire Safety Requirements for Existing  
     Ambulatory Care Facilities . . . . . APPENDIX K-1  
 K103 Incidental Uses in Existing  
     Ambulatory Care Facilities . . . . . APPENDIX K-3  
 K104 Means of Egress Requirements for  
     Existing Ambulatory Care  
     Facilities . . . . . APPENDIX K-3  
 K105 Referenced Standards. . . . . APPENDIX K-4

**APPENDIX L REQUIREMENTS FOR  
 FIRE FIGHTER AIR  
 REPLENISHMENT  
 SYSTEMS. . . . . APPENDIX L-1**

Section

L101 General . . . . . APPENDIX L-1  
 L102 Definitions . . . . . APPENDIX L-1  
 L103 Permits . . . . . APPENDIX L-1  
 L104 Design and Installation. . . . . APPENDIX L-1  
 L105 Acceptance Tests . . . . . APPENDIX L-3  
 L106 Inspection, Testing  
     and Maintenance. . . . . APPENDIX L-3  
 L107 Referenced Standards. . . . . APPENDIX L-3



**TABLE OF CONTENTS**

**APPENDIX M HIGH-RISE BUILDINGS—  
RETROACTIVE AUTOMATIC  
SPRINKLER  
REQUIREMENT . . . . .APPENDIX M-1**

Section

M101 Scope . . . . . APPENDIX M-1  
M102 Where Required . . . . . APPENDIX M-1  
M103 Compliance . . . . . APPENDIX M-1

**APPENDIX N INDOOR TRADE SHOWS AND  
EXHIBITIONS . . . . . APPENDIX N-1**

Section

N101 General . . . . . APPENDIX N-1  
N102 Definitions . . . . . APPENDIX N-1  
N103 Public Safety for Events . . . . . APPENDIX N-1  
N104 Interior Finish and  
Decorative Materials . . . . . APPENDIX N-2  
N105 Multiple-Level Booths . . . . . APPENDIX N-2  
N106 Covered Booths . . . . . APPENDIX N-2  
N107 Display and Storage of Hazardous  
and Combustible Materials . . . . . APPENDIX N-2  
N108 Means of Egress . . . . . APPENDIX N-3  
N109 Referenced Standards . . . . . APPENDIX N-3

**INDEX . . . . . INDEX-1**