

2021 Washington State Residential Code

Includes Washington State Amendments (Chapter 51-51 WAC)
Effective in Washington State March 15, 2024

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PREFACE

Authority

The International Residential Code[®] (Chapter 51-51 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 and amendments – 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 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 Residential 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 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 Code every three years to coincide with the model code publication. 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 Code shall be made on forms provided by the Building Code Council.

- B. **Local Amendments:** Jurisdiction may not amend the residential provisions of the State Energy Code (WAC 51-11R and WAC 51-11C).

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 Website: <https://www.sbcc.wa.gov/state-codes-regulations-guidelines/forms>.

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Effective Date

These rules were adopted by the State Building Code Council on November 18, 2022. The 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 permit and \$25.00 on 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, 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 moneys 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 Residential Code*® (IRC®) establishes minimum requirements for one- and two family dwellings and townhouses using prescriptive provisions. It is founded on broad-based principles that make possible the use of new materials and new building 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 Fire Code*® (IFC®), *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 Swimming Pool and Spa Code*® (ISPSC®), *International Wildland-Urban Interface Code*® (IWUIC®), *International Zoning Code*® (IZC®) and *International Code Council Performance Code*® (ICPC®).

The I-Codes, including the IRC, 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. Residential electrical provisions are based on the 2020 National Electrical Code® (NFPA 70). A new edition such as this is promulgated every 3 years.

Fuel gas provisions have been included through an agreement with the American Gas Association (AGA). Electrical provisions have been included through an agreement with the NFPA.

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

Maintenance

The IRC 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:

- National Association of Home Builders (NAHB)
- National Council of Structural Engineers Association (NCSEA)

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.

The maintenance process for the fuel gas provisions is based on the process used to maintain the IFGC, in conjunction with the AGA. The maintenance process for the electrical provisions is undertaken by the NFPA.

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 applicable International Code Development Committee as follows:

[RB] = IRC—Building Code Development Committee

[RE] = International Residential Energy Conservation Code Development Committee;

[MP] = IRC—Mechanical/Plumbing Code Development Committee

The [RE] committee is also responsible for the IECC—Residential Provisions.

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.

Code change proposals submitted for IRC Chapters 1 and 3 through 10, Appendices AE, AF, AH, AJ, AK, AL, AM, AN, AO, AQ, AR, AS, AT, AU, AV and AW, and definitions designated [RB] are heard by the IRC—Building Committee during the Group B (2022) cycle code development hearing. Code change proposals submitted for Chapter 11 are heard by the International Energy Conservation Code Development Committee during the Group B (2022) cycle code development hearing. Proposed changes to all other chapters are heard by the IRC Plumbing and Mechanical Committee during the Group A (2021) code development cycle.

It is very important that anyone submitting code change proposals understand 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.

CODE DEVELOPMENT HEARINGS

Group A Codes (Heard in 2021, Code Change Proposals Deadline: January 11, 2021)	Group B Codes (Heard in 2022, Code Change Proposals Deadline: January 10, 2022)
International Building Code – Egress (Chapters 10, 11, Appendix E) – Fire Safety (Chapters 7, 8, 9, 14, 26) – General (Chapters 2–6, 12, 27–33, 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)
International Fire Code	International Building Code — Structural (Chapters 15–25, Appendices F, G, H, I, J, L, M)
International Fuel Gas Code	International Existing Building Code
International Mechanical Code	International Energy Conservation Code — Commercial
International Plumbing Code	International Energy Conservation Code — Residential – IECC—Residential – IRC—Energy (Chapter 11)
International Property Maintenance Code	International Green Construction Code (Chapter 1)
International Private Sewage Disposal Code	International Residential Code – IRC—Building (Chapters 1–10, Appendices AE, AF, AH, AJ, AK, AL, AM, AO, AQ, AR, AS, AT, AU, AV, AW)
International Residential Code – IRC—Mechanical (Chapters 12–23) – IRC—Plumbing (Chapters 25–33, Appendices AG, AI, AN, AP)	
International Swimming Pool and Spa Code	
International Wildland-Urban Interface Code	
International Zoning Code	

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.

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.

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 the 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 to learn how to adopt and distribute laws based on the IRC 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 R101.1. Insert: **[NAME OF JURISDICTION]**

Table R301.2. Jurisdictions to fill in details as directed by provisions of the code.

Section P2603.5.1. Insert: **[NUMBER OF INCHES IN TWO LOCATIONS]**

Effective Use of the International Residential Code

The IRC was created to serve as a complete, comprehensive code regulating the construction of single-family houses, two-family houses (duplexes) and buildings consisting of three or more townhouse units. All buildings within the scope of the IRC are limited to three stories above grade plane. For example, a four-story single-family house would fall within the scope of the IBC, not the IRC. The benefits of devoting a separate code to residential construction include the fact that the user need not navigate through a multitude of code provisions that do not apply to residential construction in order to locate that which is applicable. A separate code also allows for residential and nonresidential code provisions to be distinct and tailored to the structures that fall within the appropriate code's scopes.

The IRC contains coverage for all components of a house or townhouse, including structural components, fireplaces and chimneys, thermal insulation, mechanical systems, fuel gas systems, plumbing systems and electrical systems.

The IRC is a prescriptive-oriented (specification) code with some examples of performance code language. It has been said that the IRC is the complete cookbook for residential construction. Section R301.1, for example, is written in performance language, but states that the prescriptive requirements of the code will achieve such performance.

It is important to understand that the IRC contains coverage for what is conventional and common in residential construction practice. While the IRC will provide all of the needed coverage for most residential construction, it might not address construction practices and systems that are atypical or rarely encountered in the industry. Sections such as R301.1.3, R301.2.2.1.1, R320.1, M1301.1, G2401.1 and P2601.1 refer to other codes either as an alternative to the provisions of the IRC or where the IRC lacks coverage for a particular type of structure, design, system, appliance or method of construction. In other words, the IRC is meant to be all inclusive for typical residential construction and it relies on other codes only where alternatives are desired or where the code lacks coverage for the uncommon aspect of residential construction. Of course, the IRC constantly evolves to address new technologies and construction practices that were once uncommon, but are now common.

The IRC is unique in that much of it, including Chapters 3 through 9 and Chapters 34 through 43, is presented in an ordered format that is consistent with the normal progression of construction, starting with the design phase and continuing through the final trim-out phase. This is consistent with the "cookbook" philosophy of the IRC.

ARRANGEMENT AND FORMAT OF THE 2021 IRC

The IRC is divided into nine main parts, specifically: Part I—Administrative, Part II—Definitions, Part III—Building Planning and Construction, Part IV—Energy Conservation, Part V—Mechanical, Part VI—Fuel Gas, Part VII—Plumbing, Part VIII—Electrical and Part IX—Referenced Standards.

The following provides a brief description of the content of each chapter and appendix of the IRC:

Chapter 1 Scope and Administration

This chapter 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 building criteria contained in the body of the code. Only through careful observation of the administrative provisions can the building official reasonably expect to demonstrate that “equal protection under the law” has been provided.

Chapter 2 Definitions

Terms defined in the code are listed alphabetically in Chapter 2. It is important to note that three chapters have their own definitions sections: Chapter 11 for the defined terms unique to energy conservation, Chapter 24 for the defined terms unique to fuel gas and Chapter 35 for the terms applicable to electrical Chapters 34 through 43. Where Chapter 24 or 35 defines a term differently than it is defined in Chapter 2, the definition applies in that chapter only. Chapter 2 definitions apply in all other locations in the code.

Where understanding a term’s definition is key to or necessary for understanding a particular code provision, the term is shown in italics where 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 not only tense, gender and plurality of defined terms, but also terms not defined in this code, is provided.

Chapter 3 Building Planning

Chapter 3 provides guidelines for a minimum level of structural integrity, life safety, fire safety and livability for inhabitants of dwelling units regulated by this code. Chapter 3 is a compilation of the code requirements specific to the building planning sector of the design and construction process. This chapter sets forth code requirements dealing with light, ventilation, sanitation, minimum room size, ceiling height and environmental comfort. Chapter 3 establishes life-safety provisions including limitations on glazing used in hazardous areas, specifications on stairways, use of guards at elevated surfaces, window and fall protection, and rules for means of egress. Snow, wind and seismic design live and dead loads and flood-resistant construction, as well as solar energy systems, and swimming pools, spas and hot tubs, are addressed in this chapter.

Chapter 4 Foundations

Chapter 4 provides the requirements for the design and construction of foundation systems for buildings regulated by this code. Provisions for seismic load, flood load and frost protection are contained in this chapter. A foundation system consists of two interdependent components: the foundation structure itself and the supporting soil.

The prescriptive provisions of this chapter provide requirements for constructing footings and walls for foundations of wood, masonry, concrete and precast concrete. In addition to a foundation's ability to support the required design loads, this chapter addresses several other factors that can affect foundation performance. These include controlling surface water and subsurface drainage, requiring soil tests where conditions warrant and evaluating proximity to slopes and minimum depth requirements. The chapter also provides requirements to minimize adverse effects of moisture, decay and pests in basements and crawl spaces.

Chapter 5 Floors

Chapter 5 provides the requirements for the design and construction of floor systems that will be capable of supporting minimum required design loads. This chapter covers four different types: wood floor framing, wood floors on the ground, cold-formed steel floor framing and concrete slabs on the ground. Allowable span tables are provided that greatly simplify the determination of joist, girder and sheathing sizes for raised floor systems of wood framing and cold-formed steel framing. This chapter also contains prescriptive requirements for wood-framed exterior decks and their attachment to the main building.

Chapter 6 Wall Construction

Chapter 6 contains provisions that regulate the design and construction of walls. The wall construction covered in Chapter 6 consists of five different types: wood framed, cold-formed steel framed, masonry, concrete and structural insulated panel (SIP). The primary concern of this chapter is the structural integrity of wall construction and transfer of all imposed loads to the supporting structure. This chapter provides the requirements for the design and construction of wall systems that are capable of supporting the minimum design vertical loads (dead, live and snow loads) and lateral loads (wind or seismic loads). This chapter contains the prescriptive requirements for wall bracing and/or shear walls to resist the imposed lateral loads due to wind and seismic activity.

Chapter 6 also regulates exterior windows and doors installed in walls. This chapter contains criteria for the performance of exterior windows and doors and includes provisions for testing and labeling, garage doors, windborne debris protection and anchorage details.

Chapter 7 Wall Covering

Chapter 7 contains provisions for the design and construction of interior and exterior wall coverings. This chapter establishes the various types of materials, materials standards and methods of application permitted for use as interior coverings, including interior plaster, gypsum board, ceramic tile, wood veneer paneling, hardboard paneling, wood shakes and wood shingles. Chapter 7 also contains requirements for the use of vapor retarders for moisture control in walls.

Exterior wall coverings provide the weather-resistant exterior envelope that protects the building's interior from the elements. Chapter 7 provides the requirements for wind resistance and water-resistive barrier for exterior wall coverings. This chapter prescribes the exterior wall coverings as well as the water-resistive barrier required beneath the exterior materials. Exterior wall coverings regulated by this section include aluminum, stone and masonry veneer, wood, hardboard, particleboard, wood structural panel siding, wood shakes and shingles, exterior plaster, steel, vinyl, fiber cement and exterior insulation finish systems.

Chapter 8 Roof-ceiling Construction

Chapter 8 regulates the design and construction of roof-ceiling systems. This chapter contains two roof-ceiling framing systems: wood framing and cold-formed steel framing. Allowable span tables are provided to simplify the selection of rafter and ceiling joist size for wood roof framing and cold-formed steel framing. Chapter 8 also provides requirements for the application of ceiling finishes, the proper ventilation of concealed spaces in roofs (e.g., enclosed attics and rafter spaces), unvented attic assemblies and attic access.

Chapter 9 Roof Assemblies

Chapter 9 regulates the design and construction of roof assemblies. A roof assembly includes the roof deck, vapor retarder, substrate or thermal barrier, insulation, vapor retarder and roof covering. This chapter provides the requirement for wind resistance of roof coverings.

The types of roof covering materials and installation regulated by Chapter 9 are: asphalt shingles, clay and concrete tile, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shakes and shingles, built-up roofs, metal roof panels, modified bitumen roofing, thermoset and thermoplastic single-ply roofing, sprayed polyurethane foam roofing, liquid applied coatings and photovoltaic shingles. Chapter 9 also provides requirements for roof drainage, flashing, above deck thermal insulation, rooftop-mounted photovoltaic systems and recovering or replacing an existing roof covering.

Chapter 10 Chimneys and Fireplaces

Chapter 10 contains requirements for the safe construction of masonry chimneys and fireplaces and establishes the standards for the use and installation of factory-built chimneys, fireplaces and masonry heaters. Chimneys and fireplaces constructed of masonry rely on prescriptive requirements for the details of their construction; the factory-built type relies on the listing and labeling method of approval. Chapter 10 provides the requirements for seismic reinforcing and anchorage of masonry fireplaces and chimneys.

Chapter 11 [RE] Energy Efficiency

Not adopted.

Chapter 12 Mechanical Administration

Chapter 12 establishes the limits of applicability of the code and describes how the code is to be applied and enforced. A mechanical code, like any other code, is intended to be adopted as a legally enforceable document and it cannot be effective without adequate provisions for its administration and enforcement. The provisions of Chapter 12 establish the authority and duties of the code official appointed by the jurisdiction having authority and also establish the rights and privileges of the design professional, contractor and property owner. It also relates this chapter to the administrative provisions in Chapter 1.

Chapter 13 General Mechanical System Requirements

Chapter 13 contains broadly applicable requirements related to appliance listing and labeling, appliance location and installation, appliance and systems access, protection of structural elements and clearances to combustibles, among others.

Chapter 14 Heating and Cooling Equipment and Appliances

Chapter 14 is a collection of requirements for various heating and cooling appliances, dedicated to single topics by section. The common theme is that all of these types of appliances use energy in one form or another, and the improper installation of such appliances would present a hazard to the occupants of the dwellings, due to either the potential for fire or the accidental release of refrigerants. Both situations are undesirable in dwellings that are covered by this code.

Chapter 15 Exhaust Systems

Chapter 15 is a compilation of code requirements related to residential exhaust systems, including kitchens and bathrooms, clothes dryers and range hoods. The code regulates the materials used for constructing and installing such duct systems. Air brought into the building for ventilation, combustion or makeup purposes is protected from contamination by the provisions found in this chapter.

Chapter 16 Duct Systems

Chapter 16 provides requirements for the installation of ducts for supply, return and exhaust air systems. This chapter contains no information on the design of these systems from the standpoint of air movement, but is concerned with the structural integrity of the systems and the overall impact of the systems on the fire-safety performance of the building. This chapter regulates the materials and methods of construction which affect the performance of the entire air distribution system.

Chapter 17 Combustion Air

Complete combustion of solid and liquid fuel is essential for the proper operation of appliances, control of harmful emissions and achieving maximum fuel efficiency. If insufficient quantities of oxygen are supplied, the combustion process will be incomplete, creating dangerous byproducts and wasting energy in the form of unburned fuel (hydrocarbons). The byproducts of incomplete combustion are poisonous, corrosive and combustible, and can cause serious appliance or equipment malfunctions that pose fire or explosion hazards.

The combustion air provisions in this code from previous editions have been deleted from Chapter 17 in favor of a single section that directs the user to NFPA 31 for oil-fired appliance combustion air requirements and the manufacturer's installation instructions for solid fuel-burning appliances. If fuel gas appliances are used, the provisions of Chapter 24 must be followed.

Chapter 18 Chimneys and Vents

Chapter 18 regulates the design, construction, installation, maintenance, repair and approval of chimneys, vents and their connections to fuel-burning appliances. A properly designed chimney or vent system is needed to conduct the flue gases produced by a fuel-burning appliance to the outdoors. The provisions of this chapter are intended to minimize the hazards associated with high temperatures and potentially toxic and corrosive combustion gases. This chapter addresses factory-built and masonry chimneys, vents and venting systems used to vent oil-fired and solid fuel-burning appliances.

Chapter 19 Special Appliances, Equipment and Systems

Chapter 19 regulates the installation of fuel-burning appliances that are not covered in other chapters, such as ranges and ovens, sauna heaters, fuel cell power plants and hydrogen systems. Because the subjects in this chapter do not contain the volume of text necessary to warrant individual chapters, they have been combined into a single chapter. The only commonality is that the subjects use energy to perform some task or function. The intent is to provide a reasonable level of protection for the occupants of the dwelling.

Chapter 20 Boilers and Water Heaters

Chapter 20 regulates the installation of boilers and water heaters. Its purpose is to protect the occupants of the dwelling from the potential hazards associated with such appliances. A water heater is any appliance that heats potable water and supplies it to the plumbing hot water distribution system. A boiler either heats water or generates steam for space heating and is generally a closed system.

Chapter 21 Hydronic Piping

Hydronic piping includes piping, fittings and valves used in building space conditioning systems. Applications include hot water, chilled water, steam, steam condensate, brines and water/antifreeze mixtures. Chapter 21 regulates installation, alteration and repair of all hydronic piping systems to ensure the reliability, serviceability, energy efficiency and safety of such systems.

Chapter 22 Special Piping and Storage Systems

Chapter 22 regulates the design and installation of fuel oil storage and piping systems. The regulations include reference to construction standards for above-ground and underground storage tanks, material standards for piping systems (both above-ground and underground) and extensive requirements for the proper assembly of system piping and components. The purpose of this chapter is to prevent fires, leaks and spills involving fuel oil storage and piping systems, whether inside or outside structures and above or underground.

Chapter 23 Solar Thermal Energy Systems

Chapter 23 contains requirements for the construction, alteration and repair of all systems and components of solar thermal energy systems used for space heating or cooling, and domestic hot water heating or processing. The provisions of this chapter are limited to those necessary to achieve installations that are relatively hazard free.

A solar thermal energy system can be designed to handle 100 percent of the energy load of a building, although this is rarely accomplished. Because solar energy is a low-intensity energy source and dependent on the weather, it is usually necessary to supplement a solar thermal energy system with traditional energy sources.

As our world strives to find alternate means of producing power for the future, the requirements of this chapter will become more and more important over time.

Chapter 24 Fuel Gas

Chapter 24 regulates the design and installation of fuel gas distribution piping and systems, appliances, appliance venting systems and combustion air provisions. The definition of "Fuel gas" includes natural, liquefied petroleum and manufactured gases and mixtures of these gases.

The purposes of this chapter are to establish the minimum acceptable level of safety and to protect life and property from the potential dangers associated with the storage, distribution and use of fuel gases and the byproducts of combustion of such fuels. This code also protects the personnel who install, maintain, service and replace the systems and appliances addressed herein.

Chapter 24 is composed entirely of text extracted from the IFGC; therefore, whether using the IFGC or the IRC, the fuel gas provisions will be identical. Note that to avoid the potential for confusion and conflicting definitions, Chapter 24 has its own definition section.

Chapter 25 Plumbing Administration

Not adopted.

Chapter 26 General Plumbing Requirements

Not adopted.

Chapter 27 Plumbing Fixtures

Not adopted.

Chapter 28 Water Heaters

Not adopted.

Chapter 29 Water Supply and Distribution

Not adopted except for Section 2904.

Chapter 30 Sanitary Drainage

Not adopted.

Chapter 31 Vents

Not adopted.

Chapter 32 Traps

Not adopted.

Chapter 33 Storm Drainage

Not adopted.

Chapter 34 General Requirements

Not adopted.

Chapter 35 Electrical Definitions

Not adopted.

Chapter 36 Services

Not adopted.

Chapter 37 Branch Circuit and Feeder Requirements

Not adopted.

Chapter 38 Wiring Methods

Not adopted.

Chapter 39 Power and Lighting Distribution

Not adopted.

Chapter 40 Devices and Luminaires

Not adopted.

Chapter 41 Appliance Installation

Not adopted.

Chapter 42 Swimming Pools

Not adopted.

Chapter 43 Class 2 Remote-control, Signaling and Power-limited Circuits

Not adopted.

Chapter 44 Referenced Standards

The code contains numerous references to standards that are used to regulate materials and methods of construction. Chapter 44 contains a comprehensive list of all standards that are referenced in the code. The standards are part of the code to the extent of the reference to the standard. Compliance with the referenced standard is necessary for compliance with this code. By providing specifically adopted standards, the construction and installation requirements necessary for compliance with the code can be readily determined. The basis for code compliance is, therefore, established and available on an equal basis to the code official, contractor, designer and owner.

Chapter 44 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 upon 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.

Chapter 45 Existing Building and Structures

Chapter 45 contains requirements for repairs, alterations, additions, and relocation of existing buildings and structures.

Appendix AA Sizing and Capacities of Gas Piping

This appendix is informative and not part of the code. It provides design guidance, useful facts and data and multiple examples of how to apply the sizing tables and sizing methodologies of Chapter 24.

Appendix AB Sizing of Venting Systems Serving Appliances Equipped with Draft Hoods, Category I Appliances, and Appliances Listed for Use with Type B Vents

This appendix is informative and not part of the code. It contains multiple examples of how to apply the vent and chimney tables and methodologies of Chapter 24.

Appendix AC Exit Terminals of Mechanical Draft and Direct-vent Venting Systems

This appendix is informative and not part of the code. It consists of a figure and notes that visually depict code requirements from Chapter 24 for vent terminals with respect to the openings found in building exterior walls.

Appendix AD Recommended Procedure for Safety Inspection of an Existing Appliance Installation

This appendix is informative and not part of the code. It provides recommended procedures for testing and inspecting an appliance installation to determine if the installation is operating safely and if the appliance is in a safe condition.

Appendix AE Manufactured Housing Used as Dwellings

The criteria for the construction of manufactured homes are governed by the National Manufactured Housing Construction and Safety Act. While this act may seem to cover the bulk of the construction of manufactured housing, it does not cover those areas related to the placement of the housing on the property. The provisions of Appendix AE are not applicable to the design and construction of manufactured homes. Appendix AE provides a complete set of regulations in conjunction with federal law for the installation of manufactured housing. This appendix also contains provisions for existing manufactured home installations.

Appendix AF Radon Control Methods

Radon comes from the natural (radioactive) decay of the element radium in soil, rock and water and finds its way into the air. Appendix AF contains requirements to mitigate the transfer of radon gases from the soil into the dwelling. The provisions of this appendix regulate the design and construction of radon-resistant measures intended to reduce the entry of radon gases into the living space of residential buildings.

Appendix AG Piping Standards for Various Applications

Appendix AG provides standards for various types of plastic piping products. This appendix is informative and is not part of the code.

Appendix AH Patio Covers

Appendix AH sets forth the regulations and limitations for patio covers. The provisions address those uses permitted in patio cover structures, the minimum design loads to be assigned for structural purposes, and the effect of the patio cover on egress and emergency escape or rescue from sleeping rooms. This appendix also contains the special provisions for aluminum screen enclosures in hurricane-prone regions.

Appendix AI Private Sewage Disposal

Appendix AI simply provides the opportunity to utilize the International Private Sewage Disposal Code for the design and installation of private sewage disposal in one- and two-family dwellings.

Appendix AJ Existing Buildings and Structures

Appendix AJ contains the provisions for the repair, renovation, alteration and reconstruction of existing buildings and structures that are within the scope of this code. To accomplish this objective and to make the rehabilitation process more available, this appendix allows for a controlled departure from full code compliance without compromising minimum life safety, fire safety, structural and environmental features of the rehabilitated existing building or structure.

Appendix AK Sound Transmission

Appendix AK regulates the sound transmission of wall and floor-ceiling assemblies separating dwelling units and townhouse units. Airborne sound insulation is required for walls. Airborne sound insulation and impact sound insulation are required for floor-ceiling assemblies. The provisions in Appendix AK set forth a minimum Sound Transmission Class (STC) rating for common walls and floor-ceiling assemblies between dwelling units. In addition, a minimum Impact Insulation Class (IIC) rating is also established to limit structureborne sound through common floor-ceiling assemblies separating dwelling units.

Appendix AL Permit Fees

Appendix AL provides guidance to jurisdictions for setting appropriate permit fees. This appendix will aid many jurisdictions to assess permit fees that will assist to fairly and properly administer the code. This appendix can be used for informational purposes only or may be adopted when specifically referenced in the adopting ordinance.

Appendix AM Home Day Care—R-3 Occupancy

Appendix AM provides means of egress and smoke detection requirements for a Group R-3 Occupancy that is to be used as a home day care for more than five children who receive custodial care for less than 24 hours. This appendix is strictly for guidance and/or adoption by those jurisdictions that have Licensed Home Care Provider laws and statutes that allow more than five children to be cared for in a person's home. When a jurisdiction adopts this appendix, the provisions for day care and child care facilities in the IBC should be considered also.

Appendix AN Venting Methods

Because venting of sanitary drainage systems is a difficult concept to understand, and Chapter 31 uses only words to describe venting requirements, illustrations can offer greater insight into what the words mean. Appendix AN has a number of illustrations for commonly installed sanitary drainage systems in order for the reader to gain a better understanding of this code's venting requirements.

Appendix AO Automatic Vehicular Gates

Appendix AO provides the requirements for the design and construction of automatic vehicular gates. The provisions are for where automatic gates are installed for use at a vehicular entrance or exit on the lot of a one- or two-family dwelling. The requirements provide protection for individuals from potential entrapment between an automatic gate and a stationary object or surface.

Appendix AP Sizing of Water Piping System

Appendix AP provides two recognized methods for sizing the water service and water distribution piping for a building. The method under Section AP103 provides friction loss diagrams that require the user to "plot" points and read values from the diagrams in order to perform the required calculations and necessary checks. This method is the most accurate of the two presented in this appendix. The method under Section AP201 is known to be conservative; however, very few calculations are necessary in order to determine a pipe size that satisfies the flow requirements of any application.

Appendix AQ Tiny Houses

For dwelling units that are 400 square feet (37 m²) or less in floor area, excluding lofts, Appendix AQ provides relaxed provisions as compared to those in the body of the code. These provisions primarily address reduced ceiling heights for loft areas and specific stair and ladder detail requirements that allow for more compact designs where accessing lofts.

Appendix AR Light Straw-clay Construction

This appendix regulates the use of light straw-clay as a construction material. It is limited in application to nonbearing wall infill systems.

Appendix AS Strawbale Construction

This appendix provides prescriptive requirements for the use of strawbale as a construction material. It is limited in application to the walls of one-story structures, except where additional engineering is provided.

Appendix AT Solar-ready Provisions—Detached One- and Two-family Dwellings and Townhouses

This appendix provides requirements for preparation of a house for future installation of solar equipment for electrical power or heating. Given the growing popularity of solar power and the possible need for the equipment in the future, this appendix, if adopted, would require an area be provided on the building roof that would accommodate solar equipment. In addition, pathways for routing of plumbing and conduit need to be provided.

Appendix AU Cob Construction (Monolithic Adobe)

This appendix provides prescriptive requirements for the use of natural cob (monolithic adobe) as a construction material. It is limited in application to the walls of one-story structures, except where additional engineering is provided.

Appendix AV Board of Appeals

This appendix provides criteria for Board of Appeals members and procedures by which the Board of Appeals should conduct its business.

Appendix AW 3D-printed Building Construction

Appendix AW provides for the design, construction and inspection of buildings, structures and building elements fabricated by 3D-printed construction techniques.

Appendix AX Zero Energy Residential Building Provisions

This appendix provides requirements for residential buildings intended to result in net zero energy consumption over the course of a year.

Washington State Appendix AWU — Dwelling Unit Fire Sprinkler Systems

Washington State Appendix AWU refers to Section P2904 for the design and installation of dwelling unit fire sprinkler systems. Washington Appendix AWU is included in the adoption of the *International Residential Code* as Washington State amendment.

Washington State Appendix AWW — Fire Sprinklers

Washington State Appendix AWW refers to Washington State Appendix AWU for the installation of automatic fire sprinkler systems in new one-family and two-family dwellings and townhouses. The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance. Appendix AWW may be adopted by any local government upon notification of the Washington State Building Code Council.

Washington State Appendix AWY — Construction and Demolition Material Management

The purpose of adopting Washington State Appendix AWY is to increase the amount of material salvaged for reuse through the act of deconstruction when a building or structure is demolished. Appendix AWY applies to new buildings and structures construction, alterations to existing buildings and structures and the demolition of existing buildings and structures having a work area greater than 750 square feet or with a project value greater than \$75,000.00, whichever is more stringent. The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance. Appendix AWY may be adopted by any local government upon notification of the Washington State Building Code Council.

Washington State Appendix AWZ — Building Deconstruction

The purpose of adopting Washington State Appendix AWZ is to increase the reuse and recycling of construction and demolition materials. Appendix AWZ applies to existing dwellings, townhouses, and accessory structures permitted to be demolished that are greater than 750 square feet. The provisions contained in this appendix are not mandatory, unless specifically referenced in the adopting ordinance. Appendix AWZ may be adopted by any local government upon notification of the Washington State Building Code Council.

TABLE OF CONTENTS

<i>Part I—Administrative</i>	<i>1-1</i>	<i>Part III—Building Planning and Construction</i>	<i>3-1</i>
CHAPTER 1 SCOPE AND ADMINISTRATION	1-1	CHAPTER 3 BUILDING PLANNING	3-1
PART 1—SCOPE AND APPLICATION	1-1	Section	
Section		R301 Design Criteria	3-1
WAC 54-54-001		R302 Fire-Resistant Construction	3-33
Authority	1-1	R303 Light, Ventilation and Heating	3-41
WAC 51-51-002		R304 Minimum Room Areas	3-41
Purpose	1-1	R305 Ceiling Height	3-41
WAC 51-51-003		R306 Sanitation	3-41
International Residential Code	1-1	R307 Toilet, Bath and Shower Spaces	3-43
WAC 51-51-007		R308 Glazing	3-43
Exceptions	1-1	R309 Garages and Carports	3-47
WAC 51-51-008		R310 Emergency Escape and Rescue Openings	3-47
Implementation	1-1	R311 Means of Egress	3-49
R101 Scope and General Requirements	1-1	R312 Guards and Window Fall Protection	3-53
R102 Applicability	1-2	R313 Automatic Fire Sprinkler Systems	3-53
PART 2—ADMINISTRATION AND ENFORCEMENT	1-3	R314 Smoke Alarms and Heat Detection	3-54
Section		R315 Carbon Monoxide Alarms	3-55
R103 Department of Building Safety	1-3	R316 Foam Plastic	3-56
R104 Duties and Powers of the Building Official	1-3	R317 Protection of Wood and Wood-Based Products Against Decay	3-58
R105 Permits	1-5	R318 Protection Against Subterranean Termites	3-59
R106 Construction Documents	1-7	R319 Site Address	3-60
R107 Temporary Structures and Uses	1-8	R320 Accessibility	3-60
R108 Fees	1-8	R321 Elevators and Platform Lifts	3-60
R109 Inspections	1-8	R322 Flood-Resistant Construction	3-60
R110 Certificate of Occupancy	1-9	R323 Storm Shelters	3-65
R111 Service Utilities	1-10	R324 Solar Energy Systems	3-66
R112 Board of Appeals	1-10	R325 Mezzanines	3-67
R113 Violations	1-10	R326 Habitable Attics	3-68
R114 Stop Work Order	1-11	R327 Swimming Pools, Spas and Hot Tubs	3-68
<i>Part II—Definitions</i>	<i>2-1</i>	R328 Energy Storage Systems	3-68
CHAPTER 2 DEFINITIONS	2-1	R329 Stationary Engine Generators	3-69
Section		R330 Adult Family Homes	3-69
R201 General	2-1	R331 Family Home Child Care	3-71
R202 Definitions	2-1	R332 Protection Against Radon	3-71
		R333 Lofts	3-72
		R334 Stationary Fuel Cell Power Systems	3-72

TABLE OF CONTENTS

CHAPTER 4 FOUNDATIONS 4-1

Section
R401 General..... 4-1
R402 Materials 4-1
R403 Footings..... 4-2
R404 Foundation and Retaining Walls..... 4-26
R405 Foundation Drainage 4-46
R406 Foundation Waterproofing and
 Dampproofing 4-47
R407 Columns..... 4-48
R408 Under-Floor Space..... 4-48

CHAPTER 5 FLOORS 5-1

Section
R501 General..... 5-1
R502 Wood Floor Framing 5-1
R503 Floor Sheathing 5-10
R504 Pressure Preservative-Treated Wood
 Floors (On Ground)..... 5-12
R505 Cold-Formed Steel Floor Framing 5-12
R506 Concrete Floors (On Ground) 5-21
R507 Exterior Decks..... 5-25

CHAPTER 6 WALL CONSTRUCTION 6-1

Section
R601 General..... 6-1
R602 Wood Wall Framing 6-1
R603 Cold-Formed Steel Wall Framing 6-52
R604 Wood Structural Panels..... 6-89
R605 Particleboard 6-89
R606 General Masonry Construction 6-89
R607 Glass Unit Masonry 6-105
R608 Exterior Concrete Wall Construction 6-107
R609 Exterior Windows and Doors 6-179
R610 Structural Insulated Panel Wall
 Construction..... 6-180

CHAPTER 7 WALL COVERING..... 7-1

Section
R701 General..... 7-1
R702 Interior Covering..... 7-1
R703 Exterior Covering 7-7
R704 Soffits..... 7-27

**CHAPTER 8 ROOF-CEILING
CONSTRUCTION.....8-1**

Section
R801 General8-1
R802 Wood Roof Framing8-1
R803 Roof Sheathing8-30
R804 Cold-Formed Steel Roof Framing.....8-30
R805 Ceiling Finishes.....8-46
R806 Roof Ventilation8-46
R807 Attic Access8-48

CHAPTER 9 ROOF ASSEMBLIES.....9-1

Section
R901 General9-1
R902 Fire Classification9-1
R903 Weather Protection9-1
R904 Materials9-2
R905 Requirements for Roof Coverings9-2
R906 Roof Insulation9-14
R907 Rooftop-Mounted
 Photovoltaic Panel Systems9-14
R908 Reroofing.....9-14

**CHAPTER 10 CHIMNEYS AND
FIREPLACES.....10-1**

Section
R1001 Masonry Fireplaces10-1
R1002 Masonry Heaters10-5
R1003 Masonry Chimneys10-6
R1004 Factory-Built Fireplaces.....10-10
R1005 Factory-Built Chimneys.....10-11
R1006 Exterior Air Supply10-12

Part IV—Energy Conservation11-1

CHAPTER 11 ENERGY EFFICIENCY.....11-1

Not adopted.

Part V—Mechanical.....12-1

**CHAPTER 12 MECHANICAL
ADMINISTRATION.....12-1**

Section
M1201 General.....12-1
M1202 Existing Mechanical Systems12-1

CHAPTER 13 GENERAL MECHANICAL SYSTEM REQUIREMENTS 13-1

Section

M1301 General 13-1

M1302 Approval 13-1

M1303 Labeling of Appliances 13-1

M1304 Type of Fuel 13-1

M1305 Appliance Access 13-2

M1306 Clearances from Combustible Construction ... 13-3

M1307 Appliance Installation 13-3

M1308 Mechanical Systems Installation 13-6

CHAPTER 14 HEATING AND COOLING EQUIPMENT AND APPLIANCES 14-1

Section

M1401 General 14-1

M1402 Central Furnaces 14-1

M1403 Heat Pump Equipment 14-1

M1404 Refrigeration Cooling Equipment 14-1

M1405 Baseboard Convectors 14-1

M1406 Radiant Heating Systems 14-1

M1407 Duct Heaters 14-2

M1408 Vented Floor Furnaces 14-2

M1409 Vented Wall Furnaces 14-3

M1410 Vented Room Heaters 14-3

M1411 Heating and Cooling Equipment 14-3

M1412 Absorption Cooling Equipment 14-5

M1413 Evaporative Cooling Equipment 14-5

M1414 Fireplace Stoves 14-5

M1415 Masonry Heaters 14-5

CHAPTER 15 EXHAUST SYSTEMS 15-1

Section

M1501 General 15-1

M1502 Clothes Dryer Exhaust 15-1

M1503 Domestic Cooking Exhaust Equipment 15-2

M1504 Exhaust Ducts and Exhaust Openings 15-3

M1505 Mechanical Ventilation 15-3

CHAPTER 16 DUCT SYSTEMS 16-1

Section

M1601 Duct Construction 16-1

M1602 Return Air 16-4

CHAPTER 17 COMBUSTION AIR 17-1

Section

M1701 General 17-1

CHAPTER 18 CHIMNEYS AND VENTS 18-1

Section

M1801 General 18-1

M1802 Vent Components 18-2

M1803 Chimney and Vent Connectors 18-2

M1804 Vents 18-3

M1805 Masonry and Factory-Built Chimneys 18-4

CHAPTER 19 SPECIAL APPLIANCES, EQUIPMENT AND SYSTEMS ... 19-1

Section

M1901 Ranges and Ovens 19-1

M1902 Sauna Heaters 19-1

M1903 Stationary Fuel Cell Power Plants 19-1

M1904 Gaseous Hydrogen Systems 19-1

CHAPTER 20 BOILERS AND WATER HEATERS 20-1

Section

M2001 Boilers 20-1

M2002 Operating and Safety Controls 20-1

M2003 Expansion Tanks 20-1

M2004 Water Heaters Used for Space Heating 20-2

M2005 Water Heaters 20-2

M2006 Pool Heaters 20-2

CHAPTER 21 HYDRONIC PIPING 21-1

Section

M2101 Hydronic Piping Systems Installation 21-1

M2102 Baseboard Convectors 21-4

M2103 Floor Heating Systems 21-5

M2104 Low Temperature Piping 21-5

M2105 Ground-Source Heat-Pump System Loop Piping 21-6

CHAPTER 22 SPECIAL PIPING AND STORAGE SYSTEMS 22-1

Section

M2201 Oil Tanks 22-1

M2202 Oil Piping, Fitting and Connections 22-1

M2203 Installation 22-1

M2204 Oil Pumps and Valves 22-2

TABLE OF CONTENTS

CHAPTER 23 SOLAR THERMAL ENERGY SYSTEMS 23-1

Section

M2301 Solar Thermal Energy Systems 23-1

Part VI—Fuel Gas 24-1

CHAPTER 24 FUEL GAS 24-1

Section

G2401 General 24-1

G2402 General 24-1

G2403 General Definitions 24-2

G2404 General 24-8

G2405 Structural Safety 24-8

G2406 Appliance Location 24-9

G2407 Combustion, Ventilation and Dilution Air 24-9

G2408 Installation 24-13

G2409 Clearance Reduction 24-14

G2410 Electrical 24-17

G2411 Electrical Bonding 24-17

G2412 General 24-17

G2413 Pipe Sizing 24-18

G2414 Piping Materials 24-40

G2415 Piping System Installation 24-42

G2416 Piping Bends and Changes in Direction 24-45

G2417 Inspection, Testing and Purging 24-45

G2418 Piping Support 24-47

G2419 Drips and Sloped Piping 24-47

G2420 Shutoff Valves 24-48

G2421 Flow Controls 24-49

G2422 Appliance Connections 24-49

G2423 Compressed Natural Gas Motor
Vehicle Fuel-Dispensing Facilities 24-50

G2424 Piping Support Intervals 24-50

G2425 General 24-51

G2426 Vents 24-52

G2427 Venting of Appliances 24-53

G2428 Sizing of Category I Appliance
Venting Systems 24-62

G2429 Direct-Vent, Integral Vent, Mechanical Vent
and Ventilation/Exhaust Hood Venting 24-73

G2430 Factory-Built Chimneys 24-73

G2431 General 24-74

G2432 Decorative Appliances
for Installation in Fireplaces 24-74

G2433 Log Lighters 24-74

G2434 Vented Gas Fireplaces
(Decorative Appliances) 24-74

G2435 Vented Gas Fireplace Heaters 24-74

G2436 Vented Wall Furnaces 24-74

G2437 Floor Furnaces 24-74

G2438 Clothes Dryers 24-75

G2439 Clothes Dryer Exhaust 24-75

G2440 Sauna Heaters 24-76

G2441 Pool and Spa Heaters 24-77

G2442 Forced-Air Warm-Air Furnaces 24-77

G2443 Conversion Burners 24-78

G2444 Unit Heaters 24-78

G2445 Unvented Room Heaters 24-78

G2446 Vented Room Heaters 24-78

G2447 Cooking Appliances 24-78

G2448 Water Heaters 24-79

G2449 Air-Conditioning Appliances 24-79

G2450 Illuminating Appliances 24-79

G2451 Infrared Radiant Heaters 24-79

G2452 Boilers 24-80

G2453 Outdoor Decorative Appliances 24-80

Part VII—Plumbing 25-1

CHAPTER 25 PLUMBING ADMINISTRATION 25-1

Not adopted.

CHAPTER 26 GENERAL PLUMBING REQUIREMENTS 26-1

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CHAPTER 27 PLUMBING FIXTURES 27-1

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CHAPTER 28 WATER HEATERS 28-1

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CHAPTER 29 WATER SUPPLY AND DISTRIBUTION 29-1

Not adopted, except for Section P2904.

P2904 Dwelling Unit Fire Sprinkler Systems 29-1

CHAPTER 30 SANITARY DRAINAGE 30-1

Not adopted.

CHAPTER 31 VENTS..... 31-1	CHAPTER 45 EXISTING BUILDING AND STRUCTURES..... 45-1
Not adopted.	Section
	R4501 Scope and Purpose 45-1
CHAPTER 32 TRAPS..... 32-1	R4502 Compliance..... 45-1
Not adopted.	R4503 Repairs 45-1
	R4504 Alterations 45-2
CHAPTER 33 STORM DRAINAGE..... 33-1	R4505 Additions 45-3
Not adopted.	R4506 Relocations..... 45-3
Part VIII—Electrical..... 34-1	APPENDIX AA SIZING AND CAPACITIES OF GAS PIPING.....AA-1
	Section
CHAPTER 34 GENERAL REQUIREMENTS.... 34-1	AA101 General Piping Considerations.....AA-1
Not adopted.	AA102 Description of Tables.....AA-1
CHAPTER 35 ELECTRICAL DEFINITIONS ... 35-1	AA103 Use of Capacity Tables.....AA-4
Not adopted.	AA104 Use of Sizing EquationsAA-6
CHAPTER 36 SERVICES 36-1	AA105 Pipe and Tube DiametersAA-7
Not adopted.	AA106 Examples of Piping System Design and SizingAA-7
CHAPTER 37 BRANCH CIRCUIT AND FEEDER REQUIREMENTS 37-1	APPENDIX AB SIZING OF VENTING SYSTEMS SERVING APPLIANCES EQUIPPED WITH DRAFT HOODS, CATEGORY I APPLIANCES, AND APPLIANCES LISTED FOR USE WITH TYPE B VENTS.....AB-1
Not adopted.	Section
CHAPTER 38 WIRING METHODS..... 38-1	AB101 Examples Using Single-Appliance Venting TablesAB-1
Not adopted.	AB102 Examples Using Common Venting TablesAB-4
CHAPTER 39 POWER AND LIGHTING DISTRIBUTION..... 39-1	APPENDIX AC EXIT TERMINALS OF MECHANICAL DRAFT AND DIRECT-VENT VENTING SYSTEMSAC-1
Not adopted.	Section
CHAPTER 40 DEVICES AND LUMINAIRES ... 40-1	AC101 General.....AC-1
Not adopted.	APPENDIX AD RECOMMENDED PROCEDURE FOR SAFETY INSPECTION OF AN EXISTING APPLIANCE INSTALLATIONAD-1
CHAPTER 41 APPLIANCE INSTALLATION ... 41-1	Section
Not adopted.	AD101 General.....AD-1
CHAPTER 42 SWIMMING POOLS..... 42-1	AD102 Occupant and Inspector Safety.....AD-1
Not adopted.	AD103 Gas Piping and Connections InspectionsAD-2
CHAPTER 43 CLASS 2 REMOTE-CONTROL, SIGNALING AND POWER-LIMITED CIRCUITS 43-1	AD104 Inspections to be Performed with the Appliance Not OperatingAD-2
Not adopted.	
Part IX—Referenced Standards..... 44-1	
CHAPTER 44 REFERENCED STANDARDS.... 44-1	

TABLE OF CONTENTS

AD105 Inspections to be Performed with the
Appliance Operating. AD-3
AD106 Appliance-Specific Inspections AD-4

**APPENDIX AE MANUFACTURED HOUSING
USED AS DWELLINGSAE-1**

Section

AE101 ScopeAE-1
AE102 Application to Existing Manufactured Homes
and Building Service EquipmentAE-1
AE103 DefinitionsAE-2
AE104 PermitsAE-2
AE105 Application for PermitAE-3
AE106 Permits IssuanceAE-3
AE107 Fees.AE-4
AE108 InspectionsAE-4
AE109 Special InspectionsAE-5
AE110 Utility Service.AE-5
AE111 Occupancy ClassificationAE-6
AE112 Location on PropertyAE-6
AE113 Design.AE-6
AE114 Foundation SystemsAE-6
AE115 Skirting and Perimeter EnclosuresAE-6
AE116 Structural AdditionsAE-7
AE117 Building Service Equipment.AE-7
AE118 ExitsAE-7
AE119 Occupancy, Fire Safety and Energy
Conservation StandardsAE-7
AE120 Special Requirements for
Foundation SystemsAE-7
AE121 Footings and Foundations.AE-7
AE122 Pier ConstructionAE-7
AE123 Height of PiersAE-8
AE124 Anchorage InstallationsAE-8
AE125 Ties, Materials and InstallationAE-8
AE126 Referenced Standards.AE-9

**APPENDIX AF RADON CONTROL
METHODSAF-1**

Section

AF101 ScopeAF-1
AF102 DefinitionsAF-1
AF103 RequirementsAF-1
AF104 TestingAF-5

**APPENDIX AG PIPING STANDARDS FOR
VARIOUS APPLICATIONS.AG-1**

Section

AG101 Plastic Piping Standards.AG-1
AG102 Referenced Standards.AG-1

APPENDIX AH PATIO COVERSAH-1

Section

AH101 General.AH-1
AH102 Definition.AH-1
AH103 Exterior Walls and OpeningsAH-1
AH104 Height.AH-1
AH105 Structural ProvisionsAH-1
AH106 Special Provisions for Aluminum Screen
Enclosures in Hurricane-Prone Regions . . .AH-1

**APPENDIX AI PRIVATE SEWAGE
DISPOSALAI-1**

Section

AI101 General.AI-1

**APPENDIX AJ EXISTING BUILDINGS
AND STRUCTURESAJ-1**

Section

AJ101 Purpose and IntentAJ-1
AJ102 ComplianceAJ-1
AJ103 Preliminary Meeting.AJ-2
AJ104 Evaluation of an Existing BuildingAJ-2
AJ105 Permit.AJ-2
AJ106 DefinitionsAJ-2
AJ107 RepairsAJ-3
AJ108 RenovationsAJ-3
AJ109 AlterationsAJ-4
AJ110 ReconstructionAJ-4
AJ111 Referenced Standards.AJ-5

APPENDIX AK SOUND TRANSMISSIONAK-1

Section

AK101 General.AK-1
AK102 Airborne SoundAK-1
AK103 Structural-Borne SoundAK-1
AK104 Referenced Standards.AK-1

APPENDIX AL PERMIT FEES AL-1

Section

AL101 GeneralAL-1

**APPENDIX AM HOME DAY CARE—R-3
OCCUPANCY AM-1**

Section

AM101 General. AM-1

AM102 Definition AM-1

AM103 Means of Egress. AM-1

AM104 Smoke Detection. AM-2

APPENDIX AN VENTING METHODS. AN-1

Section

AN101 Venting Methods. AN-1

**APPENDIX AO AUTOMATIC
VEHICULAR GATES AO-1**

Section

AO101 General AO-1

AO102 Definition AO-1

AO103 Automatic Vehicular Gates. AO-1

AO104 Referenced Standards AO-1

**APPENDIX AP SIZING OF WATER
PIPING SYSTEM AP-1**

Section

AP101 General AP-1

AP102 Information Required AP-1

AP103 Selection of Pipe Size AP-1

AP201 Selection of Pipe Size AP-19

APPENDIX AQ TINY HOUSES AQ-1

Section

AQ101 General AQ-1

AQ102 Definitions AQ-1

AQ103 Ceiling Height. AQ-1

AQ104 Energy Conservation. AQ-1

AQ105 Emergency Escape and Rescue Openings . . . AQ-1

AQ106 Energy Conservation. AQ-1

**APPENDIX AR LIGHT STRAW-CLAY
CONSTRUCTION AR-1**

Section

AR101 General. AR-1

AR102 Definitions. AR-1

AR103 Nonbearing Light Straw-
Clay Construction AR-1

AR104 Thermal Performance AR-4

AR105 Referenced Standards AR-4

**APPENDIX AS STRAWBALE
CONSTRUCTION AS-1**

Section

AS101 General AS-1

AS102 Definitions. AS-1

AS103 Bales AS-3

AS104 Finishes AS-3

AS105 Strawbale Walls—General AS-5

AS106 Strawbale Walls—Structural. AS-11

AS107 Fire Resistance AS-14

AS108 Thermal Insulation AS-17

AS109 Referenced Standards AS-17

**APPENDIX AT SOLAR-READY PROVISIONS—
DETACHED ONE- AND
TWO-FAMILY DWELLINGS
AND TOWNHOUSES AT-1**

Section

AT101 Scope. AT-1

AT102 General Definition. AT-1

AT103 Solar-Ready Zone AT-1

**APPENDIX AU COB CONSTRUCTION
(MONOLITHIC ADOBE). AU-1**

Section

AU101 General AU-1

AU102 Definitions. AU-2

AU103 Materials, Mixing and Installation AU-2

AU104 Finishes AU-3

AU105 Cob Walls—General. AU-4

AU106 Cob Walls—Structural AU-6

AU107 Cob Floors. AU-16

AU108 Fire Resistance AU-16

AU109 Thermal Performance AU-16

AU110 Referenced Standards AU-16

APPENDIX AV BOARD OF APPEALS AV-1

Section

AV101 General AV-1

TABLE OF CONTENTS

**APPENDIX AW 3D-PRINTED BUILDING
CONSTRUCTION.....AW-1**

Section

AW101 General. AW-1
AW102 Definitions AW-1
AW103 Building Design AW-1
AW104 Building Construction AW-1
AW105 Special Inspections AW-1
AW106 Referenced Standards AW-2

**APPENDIX AX ZERO ENERGY RESIDENTIAL
BUILDING PROVISIONS..... AX-1**

Section

AX 101 Compliance AX-1
AX 102 Zero Energy Residential Buildings AX-1
AX103 Referenced Standards AX-1

**APPENDIX AWU DWELLING UNIT FIRE
SPRINKLER SYSTEMS.... AWU-1**

APPENDIX AWV FIRE SPRINKLERS..... AWV-1

**APPENDIX AWY CONSTRUCTION AND
DEMOLITION MATERIAL
MANAGEMENT..... AWY-1**

Section

AWY101 General.AWY-1
AWY102 General DefinitionsAWY-1
AWY103 Construction and Demolition Material
ManagementAWY-1

**APPENDIX AWZ BUILDING
DECONSTRUCTIONAWZ-1**

Section

AWZ101 General.AWZ-1
AWZ102 General DefinitionsAWZ-1
AWZ103 Deconstruction.AWZ-1

INDEX.....INDEX-1