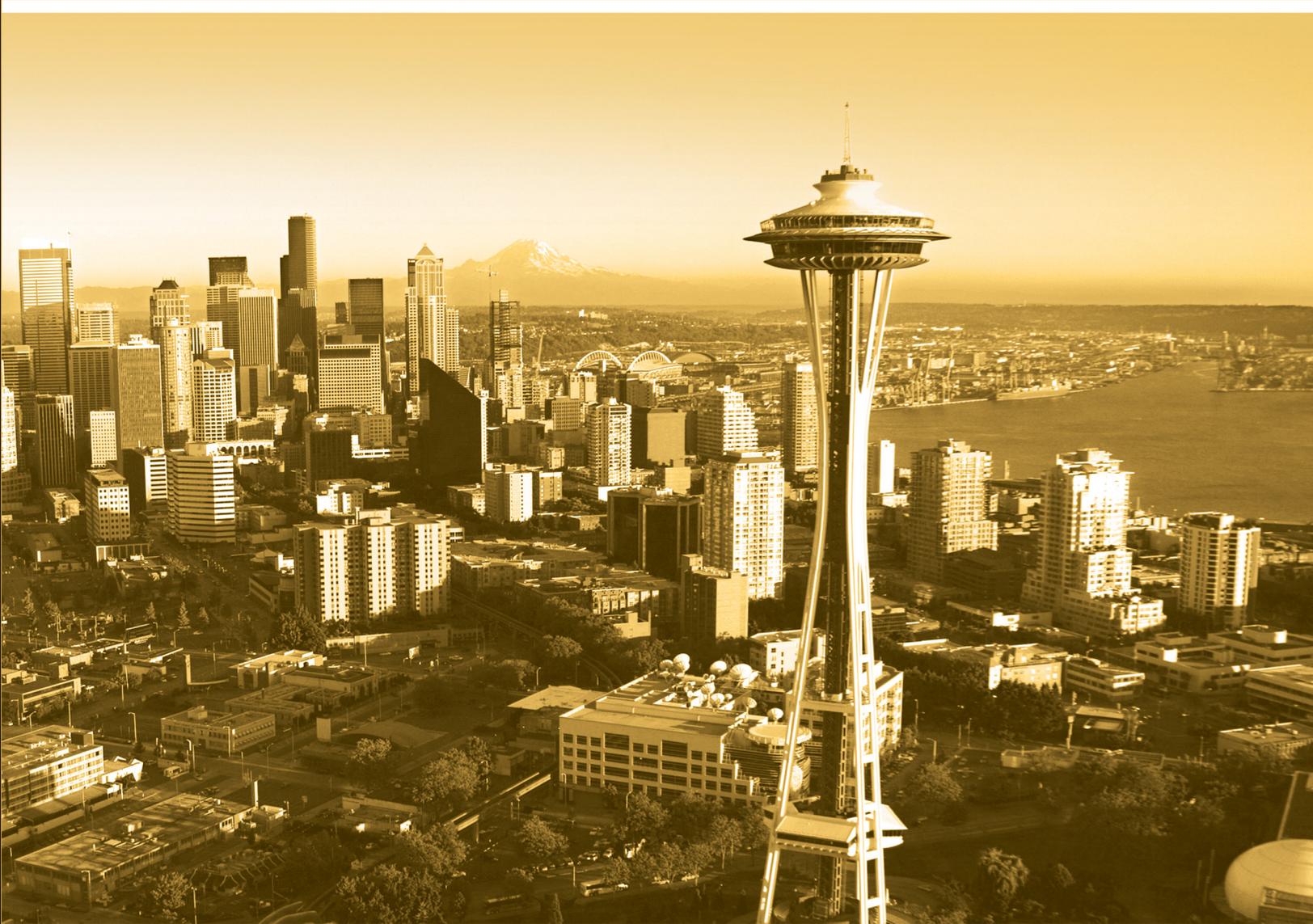


# 2012 SEATTLE FUEL GAS CODE

2012 International Fuel Gas Code® as Amended by the City of Seattle



City of  
Seattle



## 2012 Seattle Fuel Gas Code

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# PREFACE

## Introduction

Internationally, code officials recognize the need for a modern, up-to-date fuel gas code addressing the design and installation of fuel gas systems and gas-fired appliances through requirements emphasizing performance. The *International Fuel Gas Code*<sup>®</sup>, in this 2012 edition, is designed to meet these needs through model code regulations that safeguard the public health and safety in all communities, large and small.

This comprehensive fuel gas code establishes minimum regulations for fuel gas systems and gas-fired appliances using prescriptive and performance-related provisions. It is founded on broad-based principles that make possible the use of new materials and new fuel gas system and appliance designs. This 2012 edition is fully compatible with all of the *International Codes*<sup>®</sup> (I-Codes<sup>®</sup>) published by the International Code Council (ICC)<sup>®</sup>, including the *International Building Code*<sup>®</sup>, *International Energy Conservation Code*<sup>®</sup>, *International Existing Building Code*<sup>®</sup>, *International Fire Code*<sup>®</sup>, *International Green Construction Code*<sup>™</sup> (to be available March 2012), *International Mechanical Code*<sup>®</sup>, *ICC Performance Code*<sup>®</sup>, *International Plumbing Code*<sup>®</sup>, *International Private Sewage Disposal Code*<sup>®</sup>, *International Property Maintenance Code*<sup>®</sup>, *International Residential Code*<sup>®</sup>, *International Swimming Pool and Spa Code*<sup>™</sup> (to be available March 2012), *International Wildland-Urban Interface Code*<sup>®</sup> and *International Zoning Code*<sup>®</sup>.

The *International Fuel Gas Code* provisions provide many benefits, among which is the model code development process that offers an international forum for fuel gas technology professionals to discuss performance and prescriptive code requirements. This forum provides an excellent arena to debate proposed revisions. This model code also encourages international consistency in the application of provisions.

## Development

The first edition of the *International Fuel Gas Code* (1997) was the culmination of an effort initiated in 1996 by a development committee appointed by ICC and consisting of representatives of the three statutory members of the International Code Council at that time, including: Building Officials and Code Administrators International, Inc. (BOCA), International Conference of Building Officials (ICBO) and Southern Building Code Congress International (SBCCI) and the gas industry. The intent was to draft a comprehensive set of regulations for fuel gas systems and gas-fired appliances consistent with and inclusive of the scope of the existing mechanical, plumbing and gas codes. Technical content of the latest model codes promulgated by BOCA, ICBO, SBCCI and ICC and the *National Fuel Gas Code* (ANSI Z223.1) was utilized as the basis for the development. This 2012 edition presents the code as originally issued, with changes reflected in subsequent editions through 2009, and with code changes approved through the ICC Code Development Process through 2010 and standard revisions correlated with ANSI Z223.1-2012. A new edition such as this is promulgated every three years.

This code is founded on principles intended to establish provisions consistent with the scope of a fuel gas 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.

## Format

The *International Fuel Gas Code* is segregated by section numbers into two categories - "code" and "standard" - all coordinated and incorporated into a single document. The sections that are "code" are designated by the acronym "IFGC" next to the main section number (e.g., Section 101). The sections that are "standard" are designated by the acronym "IFGS" next to the main section number (e.g., Section 304). A subsection may be individually redesignated as an "IFGS" section where it is located under an "IFGC" main section.

## Adoption

The *International Fuel Gas Code* is available for adoption and use by jurisdictions internationally. Its use within a governmental jurisdiction is intended to be accomplished through adoption by reference in accordance with proceedings establishing the jurisdiction's laws. At the time of adoption, jurisdictions should insert the appropriate information in provisions requiring specific local information, such as the name of the adopting jurisdiction. These locations are shown in bracketed words in small capital letters in the code and in the sample ordinance. The sample adoption ordinance on page ix addresses several key elements of a code adoption ordinance, including the information required for insertion into the code text.

## Maintenance

The *International Fuel Gas Code* is kept up to date through the review of proposed changes submitted by code enforcing 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 code development process of the *International Fuel Gas Code* is slightly different than the process for the other *International Codes*.

Proposed changes to text designated "IFGC" are subject to the ICC Code Development Process. For more information regarding the code development process, contact the Codes and Standards Development Department of the International Code Council.

Proposed changes to text designated as "IFGS" are subject to the standards development process which maintains the *National Fuel Gas Code* (ANSI Z223.1). For more information regarding the standards development process, contact the American Gas Association (AGA) at 400 N. Capitol Street, N.W., Washington, DC 20001.

While the development procedure of the *International Fuel Gas Code* ensures the highest degree of care, the ICC, its members, the AGA and those participating in the development of this code do not accept any liability resulting from compliance or noncompliance with the provisions because the ICC, its founding members and the AGA do not have the power or authority to police or enforce compliance with the contents of this code. Only the governmental body that enacts the code into law has such authority.

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

In each code development cycle, proposed changes to the code are considered at the Code Development Hearings by the International Fuel Gas Code Development Committee, whose action constitutes a recommendation to the voting membership for final action on the proposed change. Proposed changes to a code section that has a number beginning with a letter in brackets are considered by a different code development committee. For example, proposed changes to code sections that have [B] in front of them (e.g., [B] 302.1) are considered by the appropriate International Building Code Development Committee (IBC-Structural) at the code development hearings.

The content of sections in this code that begin with a letter designation is maintained by another code development committee in accordance with the following:

- [A] = Administrative Code Development Committee;
- [B] = International Building Code Development Committee (IBC—Fire Safety, General, Means of Egress or Structural);
- [M] = International Mechanical Code Development Committee; and
- [F] = International Fire Code Development Committee.
- [W] = Washington State Code amendment.

Note that, for the development of the 2015 edition of the I-Codes, there will be two groups of code development committees and they will meet in separate years. The groupings are as follows:

<b>Group A Codes (Heard in 2012, Code Change Proposals Deadline: January 3, 2012)</b>	<b>Group B Codes (Heard in 2013, Code Change Proposals Deadline: January 3, 2013)</b>
International Building Code	Administrative Provisions (Chapter 1 all codes except IRC and ICCPC, administrative updates to currently referenced standards, and designated definitions)
International Fuel Gas Code	International Energy Conservation Code
International Mechanical Code	International Existing Building Code
International Plumbing Code	International Fire Code
International Private Sewage Disposal Code	International Green Construction Code
	ICC Performance Code
	International Property Maintenance Code
	International Residential Code
	International Swimming Pool and Spa Code
	International Wildland-Urban Interface Code
	International Zoning Code

Code change proposals submitted for code sections that have a letter designation in front of them will be heard by the respective committee responsible for such code sections. Because different committees will meet in different years, it is possible that some proposals for this code will be heard by a committee in a different year than the year in which the primary committee for this code meets.

For example, every section of Chapter 1 of this code is designated as the responsibility of the Administrative Code Development Committee, and that committee is part of the Group B code hearings. This committee will conduct its code development hearing in 2013 to consider all code change proposals for Chapter 1 of this code and proposals for Chapter 1 of all I-Codes. Therefore, any proposals received for Chapter 1 of this code will be deferred for consideration in 2013 by the Administrative Code Development Committee.

Another example is Section 707 of this code which is designated as the responsibility of the International Fire Code Development Committee. This committee will conduct its code development hearing in 2013 to consider code change proposals in its purview, which includes any proposals to Section 707.

In some cases, another committee in Group A will be responsible for a section of this code. For example, Section 306.1 has a [M] in front of the numbered section, indicating that this section of the code is the responsibility of the International Mechanical Code Development Committee. The *International Mechanical Code* is in Group A; therefore, any code change proposals to this section will be due before the Group A deadline of January 3, 2012, and these code change proposals will be assigned to the International Mechanical Code Development Committee for consideration.

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 web site at [www.iccsafe.org/scoping](http://www.iccsafe.org/scoping).

## **Marginal Markings**

Solid vertical lines in the margins within the body of the code indicate a technical change from the requirements of the 2009 edition. Dashed vertical lines in the margins indicate a technical change in the Seattle amendments.

Deletion indicators in the form of an arrow (➡) are provided in the margin where an entire section, paragraph, exception or table has been deleted or an item in a list of items or a table has been deleted. Deletion indicators in the form of a hollow arrow (⇨) are provided in the margin where a Seattle amendment has been deleted.

## **Italicized Terms**

Selected terms set forth in Chapter 2, Definitions, are italicized where they appear in code text. Such terms are not italicized where the definition set forth in Chapter 2 does not impart the intended meaning in the use of the term. The terms selected have definitions which the user should read carefully to facilitate better understanding of the code.

## **Acknowledgement**

The Department of Planning and Development thanks the members of the Construction Codes Advisory Board and its committees for the dedication, knowledge and experience they generously devoted to reviewing the 2012 Seattle codes. These volunteers donated an extraordinary number of hours to this important task. DPD and the City's elected officials rely on this commitment of time by its citizens for advice on technical matters. The City is deeply grateful for the practical perspective they provide. The City is fortunate to have the contributions of these generous people.

## **Electronic Mailing List**

If you would like to receive occasional email messages notifying you of future amendments and errata to the *Seattle Fuel Gas Code* and other codes, sign up for the technical codes mailing list at <http://www.seattle.gov/dpd/codesrules/codes/fuelgas/>

# Effective Use of the International Fuel Gas Code

The IFGC is a model code that regulates the design and installation of fuel gas distribution piping and systems, appliances, appliance venting systems, combustion air provisions, gaseous hydrogen systems and motor vehicle gaseous-fuel-dispensing stations. The definition of fuel gas includes natural, liquefied petroleum and manufactured gases and mixtures of these gases.

The purpose of the code is to establish the minimum acceptable level of safety and to protect life and property from the potential dangers associated with the storage, distribution and usage of fuel gases and the byproducts of combustion of such fuels. The code also protects the personnel that install, maintain, service and replace the systems and appliances addressed by this code.

With the exception of Section 401.1.1, the IFGC does not address utility-owned piping and equipment (i.e., anything upstream of the point of delivery). See the definition of "Point of delivery" and Section 501.8 for other code coverage exemptions.

The IFGC is primarily a specification-oriented (prescriptive) code with some performance-oriented text. For example, Section 503.3.1 is a performance statement, but Chapter 5 contains prescriptive requirements that will cause Section 503.3.1 to be satisfied.

The IFGC applies to all occupancies including one- and two-family dwellings and townhouses. The IRC is referenced for coverage of one- and two-family dwellings and townhouses; however, in effect, the IFGC provisions are still applicable because the fuel gas chapter in the IRC (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. The IFGC does not apply to piping systems that operate at pressures in excess of 125 psig for natural gas and 20 psig for LP-gas (note exception in Section 402.6).

The general Section 105.2 and the specific Sections 304.8, 402.3, 503.5.5 and 503.6.9 allow combustion air provisions, pipe sizing and chimney and vent sizing to be performed by approved engineering methods as alternatives to the prescriptive methods in the code.

## Arrangement and Format of the 2009 IFGC

The format of the IFGC allows each chapter to be devoted to a particular subject, with the exception of Chapter 3, which contains general subject matters that are not extensive enough to warrant their own independent chapter.

**Chapter 1 Scope and Administration.** Chapter 1 establishes the limits of applicability of the code and describes how the code is to be applied and enforced. A fuel gas 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 1 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.

**Chapter 2 Definitions.** Chapter 2 is the repository of the definitions of terms used in the body of the code. Codes are technical documents and every word, term and punctuation mark can impact the meaning of the code text and the intended results. The code often uses terms that have a unique meaning in the code and the code meaning can differ substantially from the ordinarily understood meaning of the term as used outside of the code.

The terms defined in Chapter 2 are deemed to be of prime importance in establishing the meaning and intent of the code text that uses the terms. The user of the code should be familiar with and consult this chapter because the definitions are essential to the correct interpretation of the code and because the user may not be aware that a term is defined.

**Chapter 3 General Regulations.** Chapter 3 contains broadly applicable requirements related to appliance location and installation, appliance and systems access, protection of structural elements and clearances to combustibles, among others. This chapter also covers combustion air provisions for gas-fired appliances.

**Chapter 4 Gas Piping Installations.** Chapter 4 covers the allowable materials for gas piping systems and the sizing and installation of such systems. It also covers pressure regulators, appliance connections and overpressure protection devices. Gas piping systems are sized to supply the maximum demand while maintaining the supply pressure necessary for safe operation of the appliances served.

**Chapter 5 Chimneys and Vents.** Chapter 5 regulates the design, construction, installation, maintenance, repair and approval of chimneys, vents, venting systems and their connections to gas-fired appliances. Properly designed chimneys, vents and venting systems are necessary to conduct to the outdoors the flue gases produced by the combustion of fuels in appliances. 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 all of the factory-built and site-built chimneys, vents and venting systems used to vent all types and categories of appliances. It also addresses direct-vent appliances, integral vent appliances, side-wall mechanically vented appliances and exhaust hoods that convey the combustion byproducts from cooking and other process appliances.

**Chapter 6 Specific Appliances.** Chapter 6 addresses specific appliances that the code intends to regulate. Each main section applies to a unique type of gas-fired appliance and specifies the product standards to which the appliance must be listed. The general requirements found in the previous Chapters 1 through 5 also apply and the sections in Chapter 6 add the special requirements that are specific to each type of appliance.

**Chapter 7 Gaseous Hydrogen Systems.** Chapter 7 is specific to gaseous hydrogen generation, storage, distribution and utilization systems, appliances and equipment. Note that hydrogen is not within the definition of "Fuel gas," but it is, nonetheless, commonly used as a fuel for fuel-cell power generation and fuel-cell powered motor vehicles. The scope of Chapter 7 is not limited to any particular use of hydrogen (see Sections 633 and 635). Hydrogen systems have unique potential hazards because of the specific gravity of the gas, its chemical effect on materials and the fact that it is not odorized.

**Chapter 8 Referenced Standards.** Chapter 8 lists all of the product and installation standards and codes that are referenced throughout Chapters 1 through 7. As stated in Section 102.8, these standards and codes become an enforceable part of the code (to the prescribed extent of the reference) as if printed in the body of the code. Chapter 8 provides the full title and edition year of the standards and codes in addition to the address of the promulgators and the section numbers in which the standards and codes are referenced.

**Appendix A 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 4.

**Appendix B 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 5.

**Appendix C 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 5 for vent terminals with respect to the openings found in building exterior walls.

**Appendix D 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.