

2012 IFC[®] CODE AND COMMENTARY

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2012 IFC[®]

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2012 International Fire Code® Commentary

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PREFACE

The principal purpose of the Commentary is to provide a basic volume of knowledge and facts relating to building construction as it pertains to the regulations set forth in the 2012 *International Fire Code*. The person who is serious about effectively designing, constructing and regulating buildings and structures will find the Commentary to be a reliable data source and reference to almost all components of the built environment.

As a follow-up to the *International Fire Code*, we offer a companion document, the *International Fire Code Commentary*. The basic appeal of the Commentary is thus: it provides in a small package and at reasonable cost thorough coverage of many issues likely to be dealt with when using the *International Fire Code* — and then supplements that coverage with historical and technical background. Reference lists, information sources and bibliographies are also included.

Throughout all of this, effort has been made to keep the vast quantity of material accessible and its method of presentation useful. With a comprehensive yet concise summary of each section, the Commentary provides a convenient reference for regulations applicable to the construction of buildings and structures. In the chapters that follow, discussions focus on the full meaning and implications of the code text. Guidelines suggest the most effective method of application, and the consequences of not adhering to the code text. Illustrations are provided to aid understanding; they do not necessarily illustrate the only methods of achieving code compliance.

The format of the Commentary includes the full text of each section, table and figure of the code, followed immediately by the commentary applicable to that text. At the time of printing, the Commentary reflects the most up-to-date text of the 2012 *International Fire Code*. Each section's narrative includes a statement of its objective and intent, and usually includes a discussion about why the requirement commands the conditions set forth. Code text and commentary text are easily distinguished from each other. All code text is shown as it appears in the *International Fire Code* and all commentary is indented below the code text and begins with the symbol ❖.

Readers should note that the Commentary is to be used in conjunction with the *International Fire Code* and not as a substitute for the code. The Commentary is advisory only; the code official alone possesses the authority and responsibility for interpreting the code.

Comments and recommendations are encouraged, for through your input, we can improve future editions. Please direct your comments to the Codes and Standards Development Department at the Chicago District Office.

The International Code Council would like to extend its thanks to the following individuals for their contributions to the technical content of this commentary:

David Fredrickson
Gene Boecker
Marcelo Hirschler

Arrangement and Format of the 2012 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 International Code Council, is arranged and organized to follow sequential steps that generally occur during a plan review or inspection. The 2012 IFC has been reorganized into 7 Parts as illustrated in the tables below. 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 reorganization 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.

2012 REORGANIZATION OF THE IFC	
Parts and Chapters	Subject Matter
Part I – Chapters 1 and 2	Administrative and definitions
Part II – Chapters 3 and 4	General safety provisions
Part III – Chapters 5 through 11	Building and equipment design features
Part III - Chapters 12 through 19	Reserved for future use
Part IV – Chapters 20 through 36	Special occupancies and operations
Part IV – Chapters 37 through 49	Reserved for future use
Part V – Chapters 50 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 J	Adoptable and informational appendices

2012 IFC CHAPTER REORGANIZATION		
CHAPTER NUMBER 2009	CHAPTER NUMBER 2012	CHAPTER TITLE
1	1	Scope and Administration
2	2	Definitions
3	3	General Requirements
4	4	Emergency Planning and Preparedness
5	5	Fire Service Features
6	6	Building Services and Systems
7	7	Fire-Resistance-Rated Construction
8	8	Interior Finish, Decorative Materials and Furnishings
9	9	Fire Protection Systems
10	10	Means Of Egress
11	20	Aviation Facilities
12	21	Dry Cleaning
13	22	Combustible Dust-Producing Operations
14	33	Fire Safety during Construction and Demolition
15	24	Flammable Finishes
16	25	Fruit and Crop Ripening
17	26	Fumigation and Insecticidal Fogging
18	27	Semiconductor Fabrication Facilities
19	28	Lumber Yards and Woodworking Facilities
20	29	Manufacture of Organic Coatings
21	30	Industrial Ovens
22	23	Motor Fuel-Dispensing Facilities and Repair Garages
23	32	High-Piled Combustible Storage
24	31	Tents and Other Membrane Structures
25	34	Tire Rebuilding and Tire Storage
26	35	Welding and Other Hot Work
27	50	Hazardous Materials—General Provisions
28	51	Aerosols
29	52	Combustible Fibers
30	53	Compressed Gases
31	54	Corrosive Materials
32	55	Cryogenic Fluids
33	56	Explosives and Fireworks
34	57	Flammable and Combustible Liquids
35	58	Flammable Gases and Flammable Cryogenic Fluids
36	59	Flammable Solids
37	60	Highly Toxic and Toxic Materials
38	61	Liquefied Petroleum Gases
39	62	Organic Peroxides

(continued)

2012 IFC CHAPTER REORGANIZATION—continued		
CHAPTER NUMBER 2009	CHAPTER NUMBER 2012	CHAPTER TITLE
40	63	Oxidizers, Oxidizing Gases and Oxidizing Cryogenic Fluids
41	64	Pyrophoric Materials
42	65	Pyroxylin (Cellulose Nitrate) Plastics
43	66	Unstable (Reactive) Materials
44	67	Water-Reactive Solids and Liquids
45	36	Marinas
46	11	Construction Requirements for Existing Buildings
47	80	Referenced Standards
Appendix A-J	Appendix A-J	No changes in reorganization

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

IFC Chapter	Subject
7	Fire-resistance-rated construction
8	Interior finish, decorative materials and furnishings
9	Fire protection systems
10	Means of egress
33	Fire safety during construction and demolition

LEGISLATION

The *International Codes* are designed and promulgated to be adopted by reference by legislative action. Jurisdictions wishing to adopt the 2012 *International Fire Code Commentary* as an enforceable set of regulations for the safeguarding of life and property from fire and explosion hazards arising from the storage, handling and use of hazardous substances, materials and devices and from conditions hazardous to life or property in the occupancy of buildings and premises should ensure that certain factual information is included in the adopting legislation at the time adoption is being considered by the appropriate governing body. The following sample adoption legislation addresses several key elements, including the information required for insertion into the code text.

SAMPLE LEGISLATION FOR ADOPTION OF THE *INTERNATIONAL FIRE CODE* ORDINANCE NO. _____

A[N] [ORDINANCE/STATUTE/REGULATION] of the [NAME OF JURISDICTION] adopting the 2012 edition of the *International Fire Code*, regulating and governing the safeguarding of life and property from fire and explosion hazards arising from the storage, handling and use of hazardous substances, materials and devices, and from conditions hazardous to life or property in the occupancy of buildings and premises in the [NAME OF JURISDICTION]; providing for the issuance of permits and collection of fees therefor; repealing [ORDINANCE/STATUTE/REGULATION] No. _____ of the [NAME OF JURISDICTION] and all other ordinances or parts of laws in conflict therewith.

The [GOVERNING BODY] of the [NAME OF JURISDICTION] does ordain as follows:

Section 1. That a certain document, three (3) copies of which are on file in the office of the [TITLE OF JURISDICTION'S KEEPER OF RECORDS] of [NAME OF JURISDICTION], being marked and designated as the *International Fire Code*, 2012 edition, including Appendix Chapters [FILL IN THE APPENDIX CHAPTERS BEING ADOPTED] (see *International Fire Code* Section 101.2.1, 2012 edition), as published by the International Code Council, be and is hereby adopted as the Fire Code of the [NAME OF JURISDICTION], in the State of [STATE NAME] regulating and governing the safeguarding of life and property from fire and explosion hazards arising from the storage, handling and use of hazardous substances, materials and devices, and from conditions hazardous to life or property in the occupancy of buildings and premises as herein provided; providing for the issuance of permits and collection of fees therefor; and each and all of the regulations, provisions, penalties, conditions and terms of said Fire Code on file in the office of the [NAME OF JURISDICTION] are hereby repealed, adopted, and made a part hereof, as if fully set out in this legislation, with the additions, insertions, deletions and changes, if any, prescribed in Section 2 of this ordinance.

Section 2. That the following sections are hereby amended:

Section 101.1. Insert: [NAME OF JURISDICTION]

Section 109.4. Insert: [OFFENSE, PENALTY AMOUNT, NUMBER OF DAYS]

Section 111.4. Insert: [DOLLAR AMOUNT IN TWO LOCATIONS]

Section 3. That the geographic limits referred to in certain sections of the 2012 *International Fire Code* are hereby established as follows:

Section 5704.2.9.6.1 (geographic limits in which the storage of Class I and Class II liquids in above-ground tanks outside of buildings is prohibited): [JURISDICTION TO SPECIFY]

Section 5706.2.1.4 (geographic limits in which the storage of Class I and Class II liquids in above-ground tanks is prohibited): [JURISDICTION TO SPECIFY]

Section 5801.2 (geographic limits in which the storage of flammable cryogenic fluids in stationary containers is prohibited): [JURISDICTION TO SPECIFY]

Section 6104.2 (geographic limits in which the storage of liquefied petroleum gas is restricted for the protection of heavily populated or congested areas): [JURISDICTION TO SPECIFY]

Section 4. That [ORDINANCE/STATUTE/REGULATION] No. _____ of [NAME OF JURISDICTION] entitled [FILL IN HERE THE COMPLETE TITLE OF THE LEGISLATION OR LAWS IN EFFECT AT THE PRESENT TIME SO THAT THEY WILL BE REPEALED BY SPECIFIC REFERENCE] and all other ordinances or parts of laws in conflict herewith are hereby repealed.

Section 5. That if any section, subsection, sentence, clause or phrase of this legislation is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this ordinance. The [GOVERNING BODY] hereby declares that it would have passed this law, and each section, subsection, clause or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses and phrases be declared unconstitutional.

Section 6. That nothing in this legislation or in the Fire Code hereby adopted shall be construed to affect any suit or proceeding impending in any court, or any rights acquired, or liability incurred, or any cause or causes of action acquired or existing, under any act or ordinance hereby repealed as cited in Section 4 of this law; nor shall any just or legal right or remedy of any character be lost, impaired or affected by this legislation.

Section 7. That the [JURISDICTION'S KEEPER OF RECORDS] is hereby ordered and directed to cause this legislation to be published. (An additional provision may be required to direct the number of times the legislation is to be published and to specify that it is to be in a newspaper in general circulation. Posting may also be required.)

Section 8. That this law and the rules, regulations, provisions, requirements, orders and matters established and adopted hereby shall take effect and be in full force and effect [TIME PERIOD] from and after the date of its final passage and adoption.

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Part I—Administrative

Chapter 1: Scope and Administration

General Comments

This chapter addresses the administration and enforcement of the code. The objectives and mandate for enforcement are beyond the scope of this chapter. Before adopting the code, a state or local government must establish and designate an agency having staff trained to administer and enforce the code. The administrative relationships, designation of the enforcement authority (fire code official), funding, training and certification of inspectors and scope of the enforcement program are determined by the adopting body.

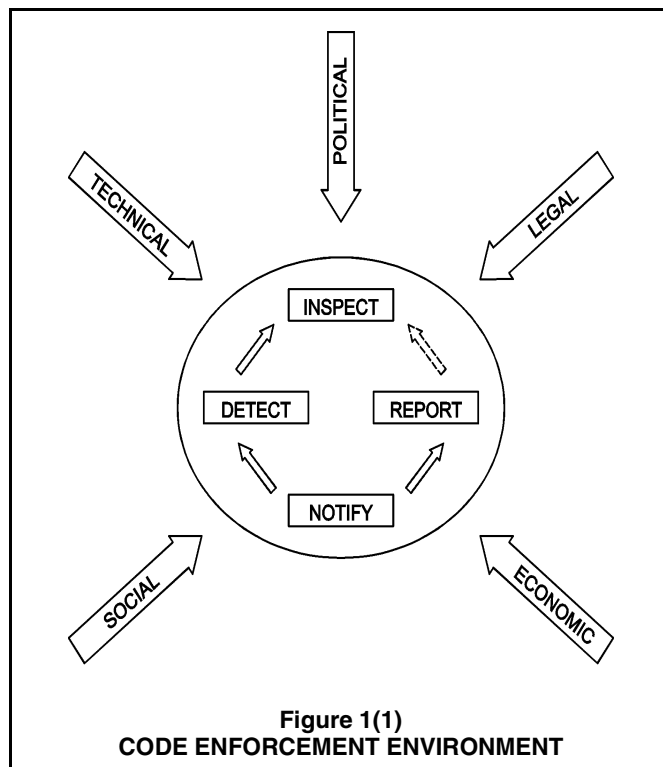
Management personnel generally perform functions, such as planning, organizing, directing, controlling, analyzing and budgeting. Though the code administrator's duties may include all of these functions, this chapter takes a much narrower view of the code administrative function, dealing mainly with technical and legal areas. Fire prevention code administration must be considered in the context of a complex environment containing political, social, economic, technical and legal dimensions. Enforcement, too, is a broad, all-inclusive term that includes a range of activities aimed at identifying and eliminating hazards; in this case, hazards causing or contributing to a fire or impairing life safety.

Four functions are commonly associated with enforcement: inspecting, detecting, notifying and reporting [see Figure 1(1)]. Chapter 1 serves as the basis for administering a code enforcement program consisting of these functions. This chapter describes the technical and legal requirements associated with administering a code enforcement program to achieve these functions. The examination of these concepts specifically provides a better understanding of the fire code official's authority, duties and liabilities.

Two main duties of the fire code official are administration and enforcement. In administration, the following concepts are most important:

Code Administrative Environment

Many administrative or management functions are not addressed in the code. Before provisions of this document can be of any use, many basic questions must be answered. Jurisdictions adopting a code enforcement program are using discretionary powers to fulfill a community need. The need in the community must be clearly identified; the program mission clearly established; and the most appropriate delivery system



selected. To address the technical and legal demands of the code administrative environment, the code assumes that jurisdictions adopting the document are interested in protecting the health, safety and welfare of its citizens from the effects of fires and explosions. Additionally, the code assumes that these jurisdictions are authorized to use the police power of the state to receive these benefits. Finally, the code assigns principal responsibility for enforcing this document to the department or agency (fire department or fire prevention bureau) most frequently available to perform this mission.

The particular objectives and social or political mandate of a code enforcement program are not considered in the context of this document. These items, however, are often cited as the most frustrating problems faced by code administrators. Code enforcers often complain of being overwhelmed by demands for leniency or special consideration based on the economic, social or political effects of their decisions.

As stated, this chapter establishes ground rules for enforcing the code; however, these ground rules are

only the technical and legal requirements binding both fire code officials and the general public. For guidance on the political, social and economic considerations associated with code enforcement activities, adopting authorities must turn elsewhere; however, none of this is intended to imply that these considerations are absent from the code process. To the contrary, by establishing these requirements as “minimums,” the ICC voting membership (see ICC Board of Directors Policy CP-28) has, through a democratic process of public hearings and debate, attempted to weigh these considerations carefully when deliberating, modifying and adopting the provisions appearing in this document. In the end, each jurisdiction must give careful consideration to how these requirements should be adopted; who should be responsible for enforcing them; how enforcement personnel should be trained; how the operation will be financed; and when and how to modify or change operations, if necessary. These considerations deserve careful, thorough public attention before a decision is made to adopt and enforce the code.

Scope and Applicability of the Code

The code applies to new and existing structures and premises as prescribed in Sections 102.1 and 102.2, in matters related to occupancy and maintenance for the protection of lives and property from fire. Conditions possibly causing or contributing to the start or spread of fire, or protecting life from hazardous incidents to occupancy and the maintenance are regulated as follows:

Retroactivity: Because the code applies to both new and existing structures and premises as prescribed in Sections 102.1 and 102.2, the existing building provisions may be considered retroactive. Existing structures and premises built in compliance with the codes and standards in effect at the time of their original construction or alteration are not in all cases exempt from code compliance.

Other codes and standards: The code relies heavily on other codes and standards to specify a means of complying with its provisions, including, among others, the *International Building Code*® (IBC®), the *International Mechanical Code*® (IMC®), the *International Fuel Gas Code*® (IFGC®) and the standards referenced in the text. Additionally, other federal, state and local codes and ordinances may establish certain requirements related to fire protection and life safety. Code requirements are intended to complement other regulations. When conflicts arise between code provisions and the referenced standards, the code provisions apply. Where a standard provides additional technical detail or guidance beyond that provided in the related code text, the fire code official must use judgment when applying these provisions to prevent conflicts with the code provisions. If a conflict arises, it is the fire code official's duty to determine which provisions secure the code's intent. When a conflict between codes or other legal action causes a portion of this document to be “struck down,” such action is not intended to invalidate the remaining

code provisions. The severability of code provisions, however, does not imply that these same provisions should be considered or applied outside of their context as a part of the code.

Fire Code Official's Judgment

The code relies heavily not only on other codes and standards but also on the judgment and experience of the fire code official.

Approval: The code details occupancy and maintenance requirements; however, it relies heavily on performance criteria, as opposed to detailed specifications, to accomplish this task. The fire code official, therefore, must exercise judgment when approving or permitting operations, processes and procedures required by the code. Proof of compliance may include certification or labeling by independent testing laboratories; however, regardless of the conclusions of these external agencies and authorities, the fire code official remains the sole judge of what fulfills the intent of the code. This becomes particularly important when the fire code official is asked to evaluate equivalent methods and materials. Having piles of data may seem helpful, but the data may prove to be meaningless when it is considered in the context of the code's intent. Data in support of alternative methods and materials must demonstrate not only compliance with the code's intent but also relevance to the issues at hand. Evidence, such as a label or an independent laboratory test report, may sometimes be used inappropriately to support an application for recognition of equivalency. The fire code official must evaluate all submitted evidence to make sure it applies to its intended use, as well as to the code's intent. In an increasingly technical and litigious society, learning how to make such decisions and judgments may be the biggest challenge facing fire code officials. Relying on strict interpretations of intent or the “letter” of the code may be the conservative way, but conservative approaches may simply increase the social and political pressures confronting fire code officials. Computers have become desktop fixtures in today's professional offices. Decision aids taking advantage of contemporary computer technology have become increasingly popular as well. These models permit designers to quickly and easily evaluate the relationships and performance of a variety of complex variables.

Another model that does not rely on a computer is NFPA 550 [see Figure 1(2)]. This model requires little training to use or understand and is an all-inclusive representation of the variables contributing to fire safety. The model may, therefore, serve as a useful tool for qualitatively evaluating the contribution of various approaches to an overall fire safety system. Once equivalent alternative methods have been identified using the Fire Safety Concepts Tree (see “General Comments” in Chapter 3), quantitative (cost/benefit) analyses may be applied. These decision aids permit a designer to propose more innovative and creative responses to complex problems. Fire code officials