

# INTERNATIONAL BUILDING CODE<sup>®</sup>

## CODE AND COMMENTARY

### VOLUME I

# 2006



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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 2006 *International Building 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 Building Code*, we offer a companion document, the *International Building Code Commentary—Volume I*. Volume I covers Chapters 1 through 15 of the 2006 *International Building Code*. 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 Building Code* — and then supplements that coverage with historical and technical background. Reference lists, information sources and bibliographies are also included.

Throughout all of this, strenuous 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 in 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 2006 *International Building Code*. As stated in the preface to the *International Building Code*, the content of sections in the code which begin with a letter designation (i.e., Section 307) are maintained by another code development committee. 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 Building 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 Building 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 control of this commentary:

Chris Marion	Gregory Cahanin
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Richard Walke	Marcelo Hirschler
Dave Adams	Edward Keith
Zeno Martin	Phillip Samblanet
Jason Thompson	

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# Chapter 1: Administration

## General Comments

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. Section 101 addresses the scope of the code and references the other *International Codes*® that are mentioned elsewhere in the code. Section 102 establishes the applicability of the code and addresses existing structures.

Section 103 establishes the department of building safety and the appointment of department personnel. Section 104 outlines the duties and authority of the building official with regard to permits, inspections and right of entry. It also establishes the authority of the building official to approve alternative materials, used materials and modifications. Section 105 states when permits are required and establishes the procedures for the review of applications and the issuance of permits. Section 106 describes the information that must be included on the construction documents submitted with the application. Section 107 authorizes the building official to issue permits for temporary structures and uses. Section 108 establishes requirements for a fee schedule. Section 109 includes inspection duties of the building official or an inspection agency that has been approved by the building official. Provisions for the issuance of certificates of occupancy are detailed in Section 110. Section 111 gives the building official the authority to approve utility connections. Section 112 establishes the board of appeals and the criteria for making applications for appeal. Administrative provisions for violations are addressed in Section 113, including provisions for unlawful acts, violation notices, prosecution and penalties. Section 114 describes procedures for stop work orders. Section 115 establishes the criteria for unsafe structures and equipment and the procedures to be followed by the building official for abatement and for notification to the responsible party.

Each state's building code enabling legislation, which is grounded within the police power of the state, is the source of all authority to enact building codes. In terms of how it is used, police power is the power of the state to legislate for the general welfare of its citizens. This power enables passage of such laws as building codes. If the state legislature has limited this power in any way, the municipality may not exceed these limitations. While the municipality may not further delegate its police power (e.g., by delegating the burden of determining code compliance to the building owner, contractor or architect), it may turn over the administration of the building code to a municipal official, such as a building official, provided that

sufficient criteria are given to establish clearly the basis for decisions as to whether or not a proposed building conforms to the code.

Chapter 1 is largely concerned with maintaining "due process of law" in enforcing the building performance criteria contained in the body of the code. Only through careful observation of the administrative provisions can the building official reasonably hope to demonstrate that "equal protection under the law" has been provided. While it is generally assumed that the administration and enforcement section of a code is geared toward a building official, this is not entirely true. The provisions also establish the rights and privileges of the design professional, contractor and building owner. The position of the building official is merely to review the proposed and completed work and to determine if the construction conforms to the code requirements. The design professional is responsible for the design of a safe structure. The contractor is responsible for constructing the structure in conformance with the plans.

During the course of construction, the building official reviews the activity to ascertain that the spirit and intent of the law are being met and that the safety, health and welfare of the public will be protected. As a public servant, the building official enforces the code in an unbiased, proper manner. Every individual is guaranteed equal enforcement of the provisions of the code. Furthermore, design professionals, contractors and building owners have the right of due process for any requirement in the code.

## Purpose

A building code, as with any other code, is intended to be adopted as a legally enforceable document to safeguard health, safety, property and public welfare. A building code cannot be effective without adequate provisions for its administration and enforcement. The official charged with the administration and enforcement of building regulations has a great responsibility, and with this responsibility goes authority. No matter how detailed the building code may be, the building official must, to some extent, exercise his or her own judgment in determining code compliance. The building official has the responsibility to establish that the homes in which the citizens of the community reside and the buildings in which they work are designed and constructed to be structurally stable with adequate means of egress, light and ventilation and to provide a minimum acceptable level of protection to life and property from fire.



## SECTION 101 GENERAL

**101.1 Title.** These regulations shall be known as the *Building Code* of [NAME OF JURISDICTION], hereinafter referred to as “this code.”

❖ The purpose of this section is to identify the adopted regulations by inserting the name of the adopting jurisdiction into the code.

**101.2 Scope.** The provisions of this code shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures.

**Exception:** Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories above grade plane in height with a separate means of egress and their accessory structures shall comply with the *International Residential Code*.

❖ This section establishes when the regulations contained in the code must be followed, whether all or in part. Something must happen (construction of a new building, modification to an existing one or allowing an existing building or structure to become unsafe) for the code to be applicable. While such activity may not be as significant as a new building, a fence is considered a structure and, therefore, its erection is within the scope of the code. The building code is not a maintenance document requiring periodic inspections that will, in turn, result in an enforcement action, although periodic inspections are addressed by the *International Fire Code*® (IFC®).

The exception mandates that detached one- and two-family dwellings and townhouses that are not more than three stories above grade and have separate means of egress are to comply with the *International Residential Code*® (IRC®) and are not required to comply with this code. This applies to all such structures, whether or not there are lot lines separating them and also to their accessory structures, such as garages and pools. Such structures four stories or more in height are beyond the scope of the IRC and must comply with the provisions of the code and its referenced codes.

**101.2.1 Appendices.** Provisions in the appendices shall not apply unless specifically adopted.

❖ The provisions contained in Appendices A through K are not considered part of the code and are, therefore, not enforceable unless they are specifically included in the ordinance or other adopting law or regulation of the jurisdiction. See Section 1 of the sample ordinance on page v of the code for where the appendices to be adopted are to be specified in the adoption ordinance.

**101.3 Intent.** The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation,

energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations.

❖ The intent of the code is to set forth regulations that establish the minimum acceptable level to safeguard public health, safety and welfare and to provide protection for fire fighters and emergency responders in building emergencies. The intent becomes important in the application of such sections as Sections 102, 104.11 and 113 as well as any enforcement-oriented interpretive action or judgement. Like any code, the written text is subject to interpretation. Interpretations should not be affected by economics or the potential impact on any party. The only considerations should be protection of public health, safety and welfare and emergency responder safety.

**101.4 Referenced codes.** The other codes listed in Sections 101.4.1 through 101.4.7 and referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

❖ The International Code Council® (ICC®) promulgates a complete set of codes to regulate the built environment. These codes are coordinated with each other so as to avoid conflicting provisions. When the code is adopted by a jurisdiction, the codes that regulate a building’s electrical, fuel gas, mechanical and plumbing systems are also included in the adoption and are considered a part of the code. The *International Property Maintenance Code*® (IPMC®) and the IFC are also referenced and enable the building official to address unsafe conditions in existing structures. Various other sections of the code also specifically refer to these codes. Note that these codes are listed in Chapter 35 and further identified by the specific year of issue. Only that edition of the code is legally adopted and any future editions are not enforceable. The issuance of new editions of all the *International Codes* occurs concurrently and new editions of the referenced codes are adopted with each new edition of the code. Adoption is done in this manner so that there are not conflicting provisions in these codes.

**101.4.1 Electrical.** The provisions of the *ICC Electrical Code* shall apply to the installation of electrical systems, including alterations, repairs, replacement, equipment, appliances, fixtures, fittings and appurtenances thereto.

❖ The *International Code Council Electrical Code Administrative Provisions* regulates all aspects of electrical systems and is adopted by reference in this section, as well as Section 2701.1, as the enforceable document for regulating electrical systems. Note that the *International Code Council Electrical Code Administrative Provisions* contains the necessary administrative provisions for enforcing the requirements of NFPA 70, the *National Electrical Code*®.

**101.4.2 Gas.** The provisions of the *International Fuel Gas Code* shall apply to the installation of gas piping from the point of delivery, gas appliances and related accessories as covered in

this code. These requirements apply to gas piping systems extending from the point of delivery to the inlet connections of appliances and the installation and operation of residential and commercial gas appliances and related accessories.

❖ The *International Fuel Gas Code*® (IFGC®) regulates gas piping and appliances and is adopted by reference from this section, as well as Section 2801.1, as the enforceable document for regulating gas systems. This section also establishes the scope of the IFGC as extending from the point of delivery to the inlet connections of each gas appliance. The “Point of delivery” is defined in the IFGC as the outlet of the service meter, regulator or shutoff valve.

**101.4.3 Mechanical.** The provisions of the *International Mechanical Code* shall apply to the installation, alterations, repairs and replacement of mechanical systems, including equipment, appliances, fixtures, fittings and/or appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems.

❖ The *International Mechanical Code*® (IMC®) regulates all aspects of a building’s mechanical systems, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems and is adopted by reference from this section, as well as Section 2801.1, as the enforceable document for regulating these systems.

**101.4.4 Plumbing.** The provisions of the *International Plumbing Code* shall apply to the installation, alteration, repair and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewage system and all aspects of a medical gas system. The provisions of the *International Private Sewage Disposal Code* shall apply to private sewage disposal systems.

❖ The *International Plumbing Code*® (IPC®) regulates the components of a building’s plumbing system, including water supply and distribution piping; sanitary and storm drainage systems; the fixtures and appliances connected thereto and medical gas and oxygen systems and is adopted by reference from this section, as well as Section 2901.1, as the enforceable document for regulating these systems. The *International Private Sewage Disposal Code*® (IPSDC®) is also adopted as the enforceable document for regulating on-site sewage disposal systems.

**101.4.5 Property maintenance.** The provisions of the *International Property Maintenance Code* shall apply to existing structures and premises; equipment and facilities; light, ventilation, space heating, sanitation, life and fire safety hazards; responsibilities of owners, operators and occupants; and occupancy of existing premises and structures.

❖ The applicability of the code to existing structures is set forth in Section 101.2 and Chapter 34 and is generally limited to new work or changes in use that occur in these buildings. The IPMC, however, is specifically intended to apply to existing structures and their premises and provides a jurisdiction with an enforceable

document for public health, safety and welfare when occupying all buildings, including those that were constructed prior to the adoption of the current building code.

**101.4.6 Fire prevention.** The provisions of the *International Fire Code* shall apply to matters affecting or relating to structures, processes and premises from the hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices; from conditions hazardous to life, property or public welfare in the occupancy of structures or premises; and from the construction, extension, repair, alteration or removal of fire suppression and alarm systems or fire hazards in the structure or on the premises from occupancy or operation.

❖ The IFC contains provisions for safeguarding structures and premises from the hazards of fire and explosion that result from the materials, substances and operations that may be present in a structure; from circumstances that endanger life, property or public welfare and from the modification or removal of fire suppression and alarm systems. Many of the provisions contained in the code, especially in Chapters 9 and 10, also appear in the IFC. So that all the *International Codes* contain consistent provisions, only one development committee is responsible for considering proposed changes to such provisions and that committee is identified by a letter designation in brackets that appears at the beginning of affected sections. This is described more fully in the preface to the codes. The IFC also contains provisions that are specifically applicable to existing structures and uses and, like the IPMC, provides a jurisdiction with an enforceable document for public health, safety and welfare in all buildings.

**101.4.7 Energy.** The provisions of the *International Energy Conservation Code* shall apply to all matters governing the design and construction of buildings for energy efficiency.

❖ The *International Energy Conservation Code*® (IECC®) contains provisions for the efficient use of energy in building construction by regulating the design of building envelopes for thermal resistance and low air leakage and the design and selection of mechanical systems for effective use of energy and is adopted by reference in this section, as well as Section 1301.1.1, as the enforceable document for regulating these systems.

## SECTION 102 APPLICABILITY

**102.1 General.** 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 a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable.

❖ The most restrictive requirement is to apply where there may be different requirements in the code for a

specific circumstance. In cases where the code establishes a specific requirement for a certain condition, that requirement is applicable even if it is less restrictive than a general requirement elsewhere in the code. For instance, specific requirements for certain uses and occupancies are located in Chapter 4 and take precedence over general requirements found in other chapters of the code. As an example, the requirements contained in Section 402.4 for means of egress in a covered mall building would govern over any differing requirements located in Chapter 10, whether the requirements in Section 402.4 are more or less restrictive.

**102.2 Other laws.** The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

- ❖ In some cases, other laws enacted by the jurisdiction or the state or federal government may be applicable to a condition that is also governed by a requirement in the code. In such circumstances, the requirements of the code are in addition to the other law that is still in effect, although the building official may not be responsible for its enforcement.

**102.3 Application of references.** References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

- ❖ In a situation where the code may make reference to a chapter or section number or to another code provision without specifically identifying its location in the code, assume that the referenced section, chapter or provision is in the code and not in a referenced code or standard.

**102.4 Referenced codes and standards.** The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

- ❖ A referenced code, standard or portion thereof is an enforceable extension of the code as if the content of the standard were included in the body of the code. For example, Section 905.2 references NFPA 14 in its entirety for the installation of standpipe systems. In those cases when the code references only portions of a standard, the use and application of the referenced standard is limited to those portions that are specifically identified. For example, Section 412.2.6 requires that aircraft hangars must be provided with fire suppression systems as required in NFPA 409. Section 412.2.6 cannot be construed to require compliance with NFPA 409 in its entirety. It is the intent of the code to be in harmony with the referenced standards. If conflicts occur because of scope or purpose, the code text governs.

**102.5 Partial invalidity.** In the event that any part or provision of this code is held to be illegal or void, this shall not have the effect of making void or illegal any of the other parts or provisions.

- ❖ Only invalid sections of the code (as established by the court of jurisdiction) can be set aside. This is essential to safeguard the application of the code text to situations when a provision is declared illegal or unconstitutional. This section preserves the legislative action that put the legal provisions in place.

**102.6 Existing structures.** The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Property Maintenance Code* or the *International Fire Code*, or as is deemed necessary by the building official for the general safety and welfare of the occupants and the public.

- ❖ An existing structure is generally “grandfathered” to be considered approved with code adoption, provided that the building meets a minimum level of safety. Frequently, the criteria for this level are the regulations (or code) under which the existing building was originally constructed. If there are no previous code criteria to apply, the building official must apply those provisions that are reasonably applicable to existing buildings. A specific level of safety is dictated by provisions dealing with hazard abatement in existing buildings and maintenance provisions, as contained in the code, the IPMC and the IFC. These codes are referenced (see Sections 101.4.5 and 101.4.6) and are applicable to existing buildings. Additionally, Chapter 34 comprehensively identifies the pertinent requirements for existing buildings on which a construction operation is intended or that undergoes a change of occupancy.

## SECTION 103 DEPARTMENT OF BUILDING SAFETY

**103.1 Creation of enforcement agency.** The Department of Building Safety is hereby created and the official in charge thereof shall be known as the building official.

- ❖ This section creates the building department and describes its composition (see Section 109 for a discussion of the inspection duties of the department). Appendix A contains qualifications for the employees of the building department involved in the enforcement of the code. A jurisdiction can establish the qualifications outlined in Appendix A for its employees by specifically referencing Appendix A in the adopting ordinance.

The executive official in charge of the building department is named the “building official” by this section. In actuality, the person who is in charge of the department may hold a different title, such as building commissioner, building inspector or construction official. For the purpose of the code, that person is referred to as the “building official.”



**103.2 Appointment.** The building official shall be appointed by the chief appointing authority of the jurisdiction.

- ❖ This section establishes the building official as an appointed position of the jurisdiction.

**103.3 Deputies.** In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the building official shall have the authority to appoint a deputy building official, the related technical officers, inspectors, plan examiners and other employees. Such employees shall have powers as delegated by the building official. For the maintenance of existing properties, see the *International Property Maintenance Code*.

- ❖ This section provides the building official with the authority to appoint other individuals to assist with the administration and enforcement of the code. These individuals would have the authority and responsibility as designated by the building official. Such appointments, however, may be exercised only with the authorization of the chief appointing authority.

## SECTION 104 DUTIES AND POWERS OF BUILDING OFFICIAL

**104.1 General.** The building official is hereby authorized and directed to enforce the provisions of this code. The building official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

- ❖ The duty of the building official is to enforce the code, and he or she is the “authority having jurisdiction” for all matters relating to the code and its enforcement. It is the duty of the building official to interpret the code and to determine compliance. Code compliance will not always be easy to determine and will require judgement and expertise, particularly when enforcing the provisions of Sections 104.10 and 104.11. In exercising this authority, however, the building official cannot set aside or ignore any provision of the code.

**104.2 Applications and permits.** The building official shall receive applications, review construction documents and issue permits for the erection, and alteration, demolition and moving of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

- ❖ The code enforcement process is normally initiated with an application for a permit. The building official is responsible for processing applications and issuing permits for the construction or modification of buildings in accordance with the code.

**104.3 Notices and orders.** The building official shall issue all necessary notices or orders to ensure compliance with this code.

- ❖ An important element of code enforcement is the necessary advisement of deficiencies and corrections, which is accomplished through written notices and orders. The building official is required to issue orders to abate illegal or unsafe conditions. Section 115.3 contains additional information for these notices.

**104.4 Inspections.** The building official shall make all of the required inspections, or the building official shall have the authority to accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The building official is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

- ❖ The building official is required to make inspections as necessary to determine compliance with the code or to accept written reports of inspections by an approved agency. The inspection of the work in progress or accomplished is another significant element in determining code compliance. While a department does not have the resources to inspect every aspect of all work, the required inspections are those that are dictated by administrative rules and procedures based on many parameters, including available inspection resources. In order to expand the available resources for inspection purposes, the building official may approve an agency that, in his or her opinion, complies with the criteria set forth in Section 1703. When unusual, extraordinary or complex technical issues arise relative to building safety, the building official has the authority to seek the opinion and advice of experts. Since this usually involves the expenditure of funds, the approval of the jurisdiction’s chief executive (or similar position) is required. A technical report from an expert requested by the building official can be used to assist in the approval process (also see Section 1704 for special inspection requirements).

**104.5 Identification.** The building official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

- ❖ This section requires the building official (including by definition all authorized designees) to carry identification in the course of conducting the duties of the position. This removes any question as to the purpose and authority of the inspector.

**104.6 Right of entry.** Where it is necessary to make an inspection to enforce the provisions of this code, or where the building official has reasonable cause to believe that there exists in a structure or upon a premises a condition which is contrary to or in violation of this code which makes the structure or premises unsafe, dangerous or hazardous, the building official is authorized to enter the structure or premises at reasonable times to

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inspect or to perform the duties imposed by this code, provided that if such structure or premises be occupied that credentials be presented to the occupant and entry requested. If such structure or premises is unoccupied, the building official shall first make a reasonable effort to locate the owner or other person having charge or control of the structure or premises and request entry. If entry is refused, the building official shall have recourse to the remedies provided by law to secure entry.

❖ The first part of this section establishes the right of the building official to enter the premises in order to make the permit inspections required by Section 109.3. Permit application forms typically include a statement in the certification signed by the applicant (who is the owner or owner's agent) granting the building official the authority to enter areas covered by the permit in order to enforce code provisions related to the permit. The right to enter other structures or premises is more limited. First, to protect the right of privacy, the owner or occupant must grant the building official permission before an interior inspection of the property can be conducted. Permission is not required for inspections that can be accomplished from within the public right-of-way. Second, such access may be denied by the owner or occupant. Unless the inspector has reasonable cause to believe that a violation of the code exists, access may be unattainable. Third, building officials must present proper identification (see Section 104.5) and request admittance during reasonable hours—usually the normal business hours of the establishment—to be admitted. Fourth, inspections must be aimed at securing or determining compliance with the provisions and intent of the regulations that are specifically within the established scope of the building official's authority.

Searches to gather information for the purpose of enforcing the other codes, ordinances or regulations are considered unreasonable and are prohibited by the Fourth Amendment to the U.S. Constitution. "Reasonable cause" in the context of this section must be distinguished from "probable cause," which is required to gain access to property in criminal cases. The burden of proof establishing reasonable cause may vary among jurisdictions. Usually, an inspector must show that the property is subject to inspection under the provisions of the code; that the interests of the public health, safety and welfare outweigh the individual's right to maintain privacy and that such an inspection is required solely to determine compliance with the provisions of the code.

Many jurisdictions do not recognize the concept of an administrative warrant and may require the building official to prove probable cause in order to gain access upon refusal. This burden of proof is usually more substantial, often requiring the building official to stipulate in advance why access is needed (usually access is restricted to gathering evidence for seeking an indictment or making an arrest); what specific items or information is sought; its relevance to the case against the individual subject; how knowledge of the relevance of

the information or items sought was obtained and how the evidence sought will be used. In all such cases, the right to privacy must always be weighed against the right of the building official to conduct an inspection to verify that public health, safety and welfare are not in jeopardy. Such important and complex constitutional issues should be discussed with the jurisdiction's legal counsel. Jurisdictions should establish procedures for securing the necessary court orders when an inspection is deemed necessary following a refusal.

**104.7 Department records.** The building official shall keep official records of applications received, permits and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for retention of public records.

❖ In keeping with the need for an efficiently conducted business practice, the building official must keep official records pertaining to permit applications, permits, fees collected, inspections, notices and orders issued. Such documentation provides a valuable resource of information if questions arise regarding the department's actions with respect to a building. The code does not require that construction documents be kept after the project is complete. It requires that other documents be kept for the length of time mandated by a jurisdiction's, or its state's, laws or administrative rules for retaining public records.

**104.8 Liability.** The building official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties. Any suit instituted against an officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by legal representative of the jurisdiction until the final termination of the proceedings. The building official or any subordinate shall not be liable for cost in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

❖ The building official, other department employees and members of the appeals board are not intended to be held liable for those actions performed in accordance with the code in a reasonable and lawful manner. The responsibility of the building official in this regard is subject to local, state and federal laws that may supersede this provision. This section further establishes that building officials (or subordinates) must not be liable for costs in any legal action instituted in response to the performance of lawful duties. These costs are to be borne by the state, county or municipality. The best way to be certain that the building official's action is a "lawful duty" is always to cite the applicable code section on which the enforcement action is based.



**104.9 Approved materials and equipment.** Materials, equipment and devices approved by the building official shall be constructed and installed in accordance with such approval.

❖ The code is a compilation of criteria with which materials, equipment, devices and systems must comply to be suitable for a particular application. The building official has a duty to evaluate such materials, equipment, devices and systems for code compliance and, when compliance is determined, approve the same for use. The materials, equipment, devices and systems must be constructed and installed in compliance with, and all conditions and limitations considered as a basis for, that approval. For example, the manufacturer's instructions and recommendations are to be followed if the approval of the material was based even in part on those instructions and recommendations. The approval authority given to the building official is a significant responsibility and is a key to code compliance. The approval process is first technical and then administrative and must be approached as such. For example, if data to determine code compliance are required, such data should be in the form of test reports or engineering analysis and not simply taken from a sales brochure.

**104.9.1 Used materials and equipment.** The use of used materials which meet the requirements of this code for new materials is permitted. Used equipment and devices shall not be reused unless approved by the building official.

❖ The code criteria for materials and equipment have changed over the years. Evaluation of testing and materials technology has permitted the development of new criteria that the old materials may not satisfy. As a result, used materials are required to be evaluated in the same manner as new materials. Used materials, equipment and devices must be equivalent to that required by the code if they are to be used again in a new installation.

**104.10 Modifications.** Wherever there are practical difficulties involved in carrying out the provisions of this code, the building official shall have the authority to grant modifications for individual cases, upon application of the owner or owner's representative, provided the building official shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, accessibility, life and fire safety, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the department of building safety.

❖ The building official may amend or make exceptions to the code as needed where strict compliance is impractical. Only the building official has authority to grant modifications. Consideration of a particular difficulty is to be based on the application of the owner and a demonstration that the intent of the code is accomplished. This section is not intended to permit setting aside or ignoring a code provision; rather, it is intended to provide acceptance of equivalent protection. Such modifi-

cations do not, however, extend to actions that are necessary to correct violations of the code. In other words, a code violation or the expense of correcting one cannot constitute a practical difficulty.

**104.11 Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

❖ The code is not intended to inhibit innovative ideas or technological advances. A comprehensive regulatory document, such as a building code, cannot envision and then address all future innovations in the industry. As a result, a performance code must be applicable to and provide a basis for the approval of an increasing number of newly developed, innovative materials, systems and methods for which no code text or referenced standards yet exist. The fact that a material, product or method of construction is not addressed in the code is not an indication that such material, product or method is intended to be prohibited. The building official is expected to apply sound technical judgement in accepting materials, systems or methods that, while not anticipated by the drafters of the current code text, can be demonstrated to offer equivalent performance. By virtue of its text, the code regulates new and innovative construction practices while addressing the relative safety of building occupants. The building official is responsible for determining if a requested alternative provides the equivalent level of protection of public health, safety and welfare as required by the code.

**104.11.1 Research reports.** Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

❖ When an alternative material or method is proposed for construction, it is incumbent upon the building official to determine whether this alternative is, in fact, an equivalent to the methods prescribed by the code. Reports providing evidence of this equivalency are required to be supplied by an approved source, meaning a source that the building official finds to be reliable and accurate. The ICC Evaluation Service is an example of an agency that provides research reports for alternative materials and methods.

**104.11.2 Tests.** Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the building official shall have the authority to

require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the building official shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the building official for the period required for retention of public records.

❖ To provide the basis on which the building official can make a decision regarding an alternative material or method, sufficient technical data, test reports and documentation must be provided for evaluation. If evidence satisfactory to the building official indicates that the alternative material or construction method is equivalent to that required by the code, he or she may approve it. Any such approval cannot have the effect of waiving any requirements of the code. The burden of proof of equivalence lies with the applicant who proposes the use of alternative materials or methods.

The building official must require the submission of any appropriate information and data to assist in the determination of equivalency. This information must be submitted before a permit can be issued. The type of information required includes test data in accordance with referenced standards, evidence of compliance with the referenced standard specifications and design calculations. A research report issued by an authoritative agency is particularly useful in providing the building official with the technical basis for evaluation and approval of new and innovative materials and methods of construction. The use of authoritative research reports can greatly assist the building official by reducing the time-consuming engineering analysis necessary to review these materials and methods. Failure to substantiate adequately a request for the use of an alternative is a valid reason for the building official to deny a request. Any tests submitted in support of an application must have been performed by an agency approved by the building official based on evidence that the agency has the technical expertise, test equipment and quality assurance to properly conduct and report the necessary testing. The test reports submitted to the building official must be retained in accordance with the requirements of Section 104.7.

## SECTION 105 PERMITS

**105.1 Required.** Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the building official and obtain the required permit.

❖ This section contains the administrative rules governing the issuance, suspension, revocation or modification of building permits. It also establishes how and by

whom the application for a building permit is to be made, how it is to be processed, fees and what information it must contain or have attached to it.

In general, a permit is required for all activities that are regulated by the code or its referenced codes (see Section 101.4), and these activities cannot begin until the permit is issued, unless the activity is specifically exempted by Section 105.2. Only the owner or a person authorized by the owner can apply for the permit. Note that this section indicates a need for a permit for a change in occupancy, even if no work is contemplated. Although the occupancy of a building or portion thereof may change and the new activity is still classified in the same group, different code provisions may be applicable. The means of egress, structural loads and light and ventilation provisions are examples of requirements that are occupancy sensitive. The purpose of the permit is to cause the work to be reviewed, approved and inspected to determine compliance with the code.

**105.1.1 Annual permit.** In lieu of an individual permit for each alteration to an already approved electrical, gas, mechanical or plumbing installation, the building official is authorized to issue an annual permit upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure or on the premises owned or operated by the applicant for the permit.

❖ In some instances, such as large buildings or industrial facilities, the repair, replacement or alteration of electrical, gas, mechanical or plumbing systems occurs on a frequent basis, and this section allows the building official to issue an annual permit for this work. This relieves both the building department and the owners of such facilities from the burden of filing and processing individual applications for this activity; however, there are restrictions on who is entitled to these permits. They can be issued only for work on a previously approved installation and only to an individual or corporation that employs persons specifically qualified in the trade for which the permit is issued. If tradespeople who perform the work involved are required to be licensed in the jurisdiction, then only those persons would be permitted to perform the work. If trade licensing is not required, then the building official needs to review and approve the qualifications of the persons who will be performing the work. The annual permit can apply only to the individual property that is owned or operated by the applicant.

**105.1.2 Annual permit records.** The person to whom an annual permit is issued shall keep a detailed record of alterations made under such annual permit. The building official shall have access to such records at all times or such records shall be filed with the building official as designated.

❖ The work performed in accordance with an annual permit must be inspected by the building official, so it is necessary to know the location of such work and when it was performed. This can be accomplished by having records of the work available to the building official ei-

ther at the premises or in the official's office, as determined by the official.

**105.2 Work exempt from permit.** Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following:

**Building:**

1. One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m<sup>2</sup>).
2. Fences not over 6 feet (1829 mm) high.
3. Oil derricks.
4. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II or IIIA liquids.
5. Water tanks supported directly on grade if the capacity does not exceed 5,000 gallons (18 925 L) and the ratio of height to diameter or width does not exceed 2:1.
6. Sidewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any basement or story below and are not part of an accessible route.
7. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
8. Temporary motion picture, television and theater stage sets and scenery.
9. Prefabricated swimming pools accessory to a Group R-3 occupancy that are less than 24 inches (610 mm) deep, do not exceed 5,000 gallons (18 925 L) and are installed entirely above ground.
10. Shade cloth structures constructed for nursery or agricultural purposes, not including service systems.
11. Swings and other playground equipment accessory to detached one- and two-family dwellings.
12. Window awnings supported by an exterior wall that do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support of Group R-3 and U occupancies.
13. Nonfixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches (1753 mm) in height.

**Electrical:**

**Repairs and maintenance:** Minor repair work, including the replacement of lamps or the connection of approved portable electrical equipment to approved permanently installed receptacles.

**Radio and television transmitting stations:** The provisions of this code shall not apply to electrical equipment

used for radio and television transmissions, but do apply to equipment and wiring for a power supply and the installations of towers and antennas.

**Temporary testing systems:** A permit shall not be required for the installation of any temporary system required for the testing or servicing of electrical equipment or apparatus.

**Gas:**

1. Portable heating appliance.
2. Replacement of any minor part that does not alter approval of equipment or make such equipment unsafe.

**Mechanical:**

1. Portable heating appliance.
2. Portable ventilation equipment.
3. Portable cooling unit.
4. Steam, hot or chilled water piping within any heating or cooling equipment regulated by this code.
5. Replacement of any part that does not alter its approval or make it unsafe.
6. Portable evaporative cooler.
7. Self-contained refrigeration system containing 10 pounds (5 kg) or less of refrigerant and actuated by motors of 1 horsepower (746 W) or less.

**Plumbing:**

1. The stopping of leaks in drains, water, soil, waste or vent pipe, provided, however, that if any concealed trap, drain pipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a permit shall be obtained and inspection made as provided in this code.
  2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.
- ❖ Section 105.1 essentially requires a permit for any activity involving work on a building and its systems and other structures. This section lists those activities that are permitted to take place without first obtaining a permit from the building department. Note that in some cases, such as Items 9, 10, 11 and 12, the work is exempt only for certain occupancies. It is further the intent of the code that even though work may be exempted for permit purposes, it must still comply with the code and the owner is responsible for proper and safe construction for all work being done. Work exempted by the codes adopted by reference in Section 101.4 is also included here.

**105.2.1 Emergency repairs.** Where equipment replacements and repairs must be performed in an emergency situation, the



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permit application shall be submitted within the next working business day to the building official.

❖ This section recognizes that in some cases, emergency replacement and repair work must be done as quickly as possible, so it is not practical to take the necessary time to apply for and obtain approval. A permit for the work must be obtained the next day that the building department is open for business. Any work performed before the permit is issued must be done in accordance with the code and corrected if not approved by the building official.

**105.2.2 Repairs.** Application or notice to the building official is not required for ordinary repairs to structures, replacement of lamps or the connection of approved portable electrical equipment to approved permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required means of egress, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include addition to, alteration of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

❖ This section distinguishes between what might be termed by some as repairs but are in fact alterations, wherein the code is to be applicable, and ordinary repairs, which are maintenance activities that do not require a permit.

**105.2.3 Public service agencies.** A permit shall not be required for the installation, alteration or repair of generation, transmission, distribution or metering or other related equipment that is under the ownership and control of public service agencies by established right.

❖ Utilities that supply electricity, gas, water, telephone, television cable, etc., do not require permits for work involving the transmission lines and metering equipment that they own and control; that is, to their point of delivery. Utilities are typically regulated by other laws that give them specific rights and authority in this area. Any equipment or appliances installed or serviced by such agencies that are not owned by them and under their full control are not exempt from a permit.

**105.3 Application for permit.** To obtain a permit, the applicant shall first file an application therefor in writing on a form furnished by the department of building safety for that purpose. Such application shall:

1. Identify and describe the work to be covered by the permit for which application is made.
2. Describe the land on which the proposed work is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or work.
3. Indicate the use and occupancy for which the proposed work is intended.

4. Be accompanied by construction documents and other information as required in Section 106.

5. State the valuation of the proposed work.

6. Be signed by the applicant, or the applicant's authorized agent.

7. Give such other data and information as required by the building official.

❖ This section requires that a written application for a permit be filed on forms provided by the building department and details the information required on the application. Permit forms will typically have sufficient space to write a very brief description of the work to be accomplished, which is sufficient for only small jobs. For larger projects, the description will be augmented by construction documents as indicated in Item 4. As required by Section 105.1, the applicant must be the owner of the property or an authorized agent of the owner, such as an engineer, architect, contractor, tenant or other. The applicant must sign the application, and permit forms typically include a statement that if the applicant is not the owner, he or she has permission from the owner to make the application.

**105.3.1 Action on application.** The building official shall examine or cause to be examined applications for permits and amendments thereto within a reasonable time after filing. If the application or the construction documents do not conform to the requirements of pertinent laws, the building official shall reject such application in writing, stating the reasons therefor. If the building official is satisfied that the proposed work conforms to the requirements of this code and laws and ordinances applicable thereto, the building official shall issue a permit therefor as soon as practicable.

❖ This section requires the building official to act with reasonable speed on a permit application. In some instances, this time period is set by state or local law. The building official must refuse to issue a permit when the application and accompanying documents do not conform to the code. In order to ensure effective communication and due process of law, the reasons for denial of an application for a permit are required to be in writing. Once the building official determines that the work described conforms with the code and other applicable laws, the permit must be issued upon payment of the fees required by Section 108.

**105.3.2 Time limitation of application.** An application for a permit for any proposed work shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the building official is authorized to grant one or more extensions of time for additional periods not exceeding 90 days each. The extension shall be requested in writing and justifiable cause demonstrated.

❖ Typically, an application for a permit is submitted and goes through a review process that ends with the issuance of a permit. If a permit has not been issued 180 days after the date of filing, however, the application is considered abandoned, unless the applicant was dili-

gent in efforts to obtain the permit. The building official has the authority to extend this time limitation (in increments of 90 days), provided there is reasonable cause. This would cover delays beyond the applicant's control, such as prerequisite permits or approvals from other authorities within the jurisdiction or state. The intent of this section is to limit the time between the review process and the issuance of a permit.

**105.4 Validity of permit.** The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a permit based on construction documents and other data shall not prevent the building official from requiring the correction of errors in the construction documents and other data. The building official is also authorized to prevent occupancy or use of a structure where in violation of this code or of any other ordinances of this jurisdiction.

❖ This section states the fundamental premise that the permit is only a license to proceed with the work. It is not a license to violate, cancel or set aside any provisions of this code. This is significant because it means that despite any errors or oversights in the approval process, the permit applicant, not the building official, is responsible for code compliance. Also, the permit can be suspended or revoked in accordance with Section 105.6.

**105.5 Expiration.** Every permit issued shall become invalid unless the work on the site authorized by such permit is commenced within 180 days after its issuance, or if the work authorized on the site by such permit is suspended or abandoned for a period of 180 days after the time the work is commenced. The building official is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

❖ The permit becomes invalid under two distinct situations—both based on a 180-day period. The first situation is when no work was initiated 180 days from issuance of a permit. The second situation is when the authorized work has stopped for 180 days. The person who was issued the permit should be notified, in writing, that the permit is invalid and what steps must be taken to reinstate it and restart the work. The building official has the authority to extend this time limitation (in increments of 180 days), provided the extension is requested in writing and there is reasonable cause, which typically includes events beyond the permit holder's control.

**105.6 Suspension or revocation.** The building official is authorized to suspend or revoke a permit issued under the provisions of this code wherever the permit is issued in error or on the basis of incorrect, inaccurate or incomplete information, or

in violation of any ordinance or regulation or any of the provisions of this code.

❖ A permit is a license to proceed with the work. The building official, however, can suspend or revoke permits shown to be based, all or in part, on any false statement or misrepresentation of fact. A permit can also be suspended or revoked if it was issued in error, such as an omitted prerequisite approval or code violation indicated on the construction documents. An applicant may subsequently apply for a reinstatement of the permit with the appropriate corrections or modifications made to the application and construction documents.

**105.7 Placement of permit.** The building permit or copy shall be kept on the site of the work until the completion of the project.

❖ The permit, or copy thereof, is to be kept on the job site until the work is complete and made available to the building official or representative to conveniently make required entries thereon.

## SECTION 106 CONSTRUCTION DOCUMENTS

**106.1 Submittal documents.** Construction documents, statement of special inspections and other data shall be submitted in one or more sets with each permit application. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.

**Exception:** The building official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that review of construction documents is not necessary to obtain compliance with this code.

❖ This section establishes the requirement to provide the building official with construction drawings, specifications and other documents that describe the structure or system for which a permit is sought (see Section 202 for a complete definition). It describes the information that must be included in the documents, who must prepare them and procedures for approving them.

A detailed description of the work for which an application is made must be submitted. When the work can be briefly described on the application form and the services of a registered design professional are not required, the building official may utilize judgement in determining the need for detailed documents. An example of work that may not involve the submission of detailed construction documents is the replacement of an existing 60-amp electrical service with a 200-amp



service. Other sections of the code also contain specific requirements for construction documents, such as Sections 1603, 1901.4, 2101.3 and 3103.2. These provisions are intended to reflect the minimum scope of information needed to determine code compliance. Although this section specifies that "one or more" sets of construction documents be submitted, note that Section 106.3.1 requires one set of approved documents to be retained by the building official and one set to be returned to the applicant, essentially requiring at least two sets of construction documents. The building official should establish a consistent policy of the number of sets required by the jurisdiction and make this information readily available to applicants.

This section also requires the building official to determine that any state professional registration laws be complied with as they apply to the preparation of construction documents.

**106.1.1 Information on construction documents.** Construction documents shall be dimensioned and drawn upon suitable material. Electronic media documents are permitted to be submitted when approved by the building official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official.

❖ The construction documents are required to be of a quality and detail such that the building official can determine that the work conforms to the code and other applicable laws and regulations. General statements on the documents, such as "all work must comply with the *International Building Code*," are not an acceptable substitute for showing the required information. The following subsections and sections in other chapters indicated in the commentary to Section 106.1 specify the detailed information that must be shown on the submitted documents. When specifically allowed by the building official, documents can be submitted in electronic form.

**106.1.1.1 Fire protection system shop drawings.** Shop drawings for the fire protection system(s) shall be submitted to indicate conformance with this code and the construction documents and shall be approved prior to the start of system installation. Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9.

❖ Since the fire protection contractor(s) may not have been selected at the time a permit is issued for construction of a building, detailed shop drawings for fire protection systems are not available. Because they provide the information necessary to determine code compliance, as specified in the appropriate referenced standard in Chapter 9, they must be submitted and approved by the building official before the contractor can begin installing the system. For example, the professional responsible for the design of an automatic sprinkler system should determine that the water supply is adequate, but will not be able to prepare a final set of hydraulic calculations if the specific materials

and pipe sizes, lengths and arrangements have not been identified. Once the installing contractor is selected, specific hydraulic calculations can be prepared. Factors such as classification of the hazard, amount of water supply available and the density or concentration to be achieved by the system are to be included with the submission of the shop drawings. Specific data sheets identifying sprinklers, pipe dimensions, power requirements for smoke detectors, etc., should also be included with the submission.

**106.1.2 Means of egress.** The construction documents shall show in sufficient detail the location, construction, size and character of all portions of the means of egress in compliance with the provisions of this code. In other than occupancies in Groups R-2, R-3, and I-1, the construction documents shall designate the number of occupants to be accommodated on every floor, and in all rooms and spaces.

❖ The complete means of egress system is required to be indicated on the plans to permit the building official to initiate a review and identify pertinent code requirements for each component. Additionally, requiring such information to be reflected in the construction documents requires the designer not only to become familiar with the code, but also to be aware of egress principles, concepts and purposes. The need to ensure that the means of egress leads to a public way is also a consideration during the plan review. Such an evaluation cannot be made without the inclusion of a site plan, as required by Section 106.2.

Information essential for determining the required capacity of the egress components (see Section 1005) and the number of egress components required from a space (see Sections 1014.1 and 1018.1) must be provided. The designer must be aware of the occupancy of a space and properly identify that information, along with its resultant occupant load, on the construction documents. In occupancies in Groups I-1, R-2 and R-3, the occupant load can be readily determined with little difference in the number so that the designation of the occupant load on the construction documents is not required.

**106.1.3 Exterior wall envelope.** Construction documents for all buildings shall describe the exterior wall envelope in sufficient detail to determine compliance with this code. The construction documents shall provide details of the exterior wall envelope as required, including flashing, intersections with dissimilar materials, corners, end details, control joints, intersections at roof, eaves or parapets, means of drainage, water-resistive membrane and details around openings.

The construction documents shall include manufacturer's installation instructions that provide supporting documentation that the proposed penetration and opening details described in the construction documents maintain the weather resistance of the exterior wall envelope. The supporting documentation shall fully describe the exterior wall system which was tested, where applicable, as well as the test procedure used.

❖ This section specifically identifies details of exterior wall construction that are critical to the weather resis-

tance of the wall and requires those details to be provided on the construction documents. Where the weather resistance of the exterior wall assembly is based on tests, the submitted documentation is to describe the details of the wall envelope and the test procedure that was used. This provides the building official with the information necessary to determine code compliance.

**106.2 Site plan.** The construction documents submitted with the application for permit shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and design flood elevations; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The building official is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration or repair or when otherwise warranted.

- ❖ Certain code requirements are dependent on the structure's location on the lot (see Sections 506.2, 507, 704, 1023 and 1205) and the topography of the site (see Sections 1104, 1107.7.4 and 1803.3). As a result, a scaled site plan containing the data listed in this section is required to permit review for compliance. The building official can waive the requirement for a site plan when it is not required to determine code compliance, such as work involving only interior alterations or repairs.

**106.3 Examination of documents.** The building official shall examine or cause to be examined the accompanying construction documents and shall ascertain by such examinations whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

- ❖ The requirements of this section are related to those found in Section 105.3.1 regarding the action of the building official in response to a permit application. The building official can delegate review of the construction documents to subordinates as provided for in Section 103.3.

**106.3.1 Approval of construction documents.** When the building official issues a permit, the construction documents shall be approved, in writing or by stamp, as "Reviewed for Code Compliance." One set of construction documents so reviewed shall be retained by the building official. The other set shall be returned to the applicant, shall be kept at the site of work and shall be open to inspection by the building official or a duly authorized representative.

- ❖ The building official must stamp or otherwise endorse as "Reviewed for Code Compliance" the construction documents on which the permit is based. One set of approved construction documents must be kept on the construction site to serve as the basis for all subsequent inspections. To avoid confusion, the construc-

tion documents on the site must be the documents that were approved and stamped. This is because inspections are to be performed with regard to the approved documents, not the code itself. Additionally, the contractor cannot determine compliance with the approved construction documents unless they are readily available. If the approved construction documents are not available, the inspection should be postponed and work on the project halted.

**106.3.2 Previous approvals.** This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

- ❖ If a permit is issued and construction proceeds at a normal pace and a new edition of the code is adopted by the legislative body, requiring that the building be constructed to conform to the new code is unreasonable. This section provides for the continuity of permits issued under previous codes, as long as such permits are being "actively prosecuted" subsequent to the effective date of the ordinance adopting this edition of the code.

**106.3.3 Phased approval.** The building official is authorized to issue a permit for the construction of foundations or any other part of a building or structure before the construction documents for the whole building or structure have been submitted, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such permit for the foundation or other parts of a building or structure shall proceed at the holder's own risk with the building operation and without assurance that a permit for the entire structure will be granted.

- ❖ The building official has the authority to issue a partial permit to allow for the practice of "fast tracking" a job. Any construction under a partial permit is "at the holder's own risk" and "without assurance that a permit for the entire structure will be granted." The building official is under no obligation to accept work or issue a complete permit in violation of the code, ordinances or statutes simply because a partial permit had been issued. Fast tracking puts an unusual administrative and technical burden on the building official. The purpose is to proceed with construction while the design continues for other aspects of the work. Coordinating and correlating the code aspects into the project in phases requires attention to detail and project tracking so that all code issues are addressed. The coordination of these submittals is the responsibility of the registered design professional in responsible charge described in Section 106.3.4.

**106.3.4 Design professional in responsible charge.**

**106.3.4.1 General.** When it is required that documents be prepared by a registered design professional, the building official shall be authorized to require the owner to engage and designate on the building permit application a registered design pro-

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professional who shall act as the registered design professional in responsible charge. If the circumstances require, the owner shall designate a substitute registered design professional in responsible charge who shall perform the duties required of the original registered design professional in responsible charge. The building official shall be notified in writing by the owner if the registered design professional in responsible charge is changed or is unable to continue to perform the duties.

The registered design professional in responsible charge shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

❖ At the time of permit application and at various intervals during a project, the code requires detailed technical information to be submitted to the building official. This will vary depending on the complexity of the project, but typically includes the construction documents with supporting information, applications utilizing the phased approval procedure in Section 106.3.3 and reports from engineers, inspectors and testing agencies required in Chapter 17. Since these documents and reports are prepared by numerous individuals, firms and agencies, it is necessary to have a single person charged with responsibility for coordinating their submittal to the building official. This person is the point of contact for the building official for all information relating to the project. Otherwise, the building official could waste time and effort attempting to locate the source of accurate information when trying to resolve an issue such as a discrepancy in plans submitted by different designers. The requirement that the owner engage a person to act as the design professional in responsible charge is applicable to projects where the construction documents are required by law to be prepared by a registered design professional (see Section 106.1) and when required by the building official. The person employed by the owner to act as the design professional in responsible charge must be identified on the permit application, but the owner can change the designated person at any time during the course of the review process or work, provided the building official is so notified in writing.

**106.3.4.2 Deferred submittals.** For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the building official within a specified period.

Deferral of any submittal items shall have the prior approval of the building official. The registered design professional in responsible charge shall list the deferred submittals on the construction documents for review by the building official.

Documents for deferred submittal items shall be submitted to the registered design professional in responsible charge who shall review them and forward them to the building official with a notation indicating that the deferred submittal docu-

ments have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the design and submittal documents have been approved by the building official.

❖ Often, especially on larger projects, details of certain building parts are not available at the time of permit issuance because they have not yet been designed; for example, exterior cladding, prefabricated items such as trusses and stairs and the components of fire protection systems (see Section 106.1.1.1). The design professional in responsible charge must identify on the construction documents the items to be included in any deferred submittals. Documents required for the approval of deferred items must be reviewed by the design professional in responsible charge for compatibility with the design of the building, forwarded to the building official with a notation that this is the case and approved by the building official before installation of the items. Sufficient time must be allowed for the approval process. Note that deferred submittals differ from the phased permits described in Section 106.3.3 in that they occur after the permit for the building is issued and are not for work covered by separate permits.

**106.4 Amended construction documents.** Work shall be installed in accordance with the approved construction documents, and any changes made during construction that are not in compliance with the approved construction documents shall be resubmitted for approval as an amended set of construction documents.

❖ Any amendments to the approved construction documents must be filed before constructing the amended item. In the broadest sense, amendments include all addenda, change orders, revised drawings and marked-up shop drawings. Building officials should maintain a policy that all amendments be submitted for review. Otherwise, a significant amendment may not be submitted because of misinterpretation, resulting in an activity that is not approved and that causes a needless delay in obtaining approval of the finished work.

**106.5 Retention of construction documents.** One set of approved construction documents shall be retained by the building official for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws.

❖ A set of the approved construction documents must be kept by the building official as may be required by state or local laws, but for a period of no less than 180 days after the work is complete. Questions regarding an item shown on the approved documents may arise in the period immediately following completion of the work and the documents should be available for review. See Section 104.7 for requirements to retain other records that are generated as a result of the work.



## SECTION 107 TEMPORARY STRUCTURES AND USES

**107.1 General.** The building official is authorized to issue a permit for temporary structures and temporary uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The building official is authorized to grant extensions for demonstrated cause.

❖ In the course of construction or other activities, structures that have a limited service life are often necessary. This section contains the administrative provisions that permit such temporary structures without full compliance with the code requirements for permanently occupied structures. This section should not be confused with the scope of Section 3103, which regulates temporary structures larger than 120 square feet (11 m<sup>2</sup>) in area.

This section allows the building official to issue permits for temporary structures or uses. The applicant must specify the time period desired for the temporary structure or use, but the approval period cannot exceed 180 days. Structures or uses that are temporary but are anticipated to be in existence for more than 180 days are required to conform to code requirements for permanent structures and uses. The section also authorizes the building official to grant extensions to this time period if the applicant can provide a valid reason for the extension, which typically includes circumstances beyond the applicant's control. This provision is not intended to be used to circumvent the 180-day limitation.

**107.2 Conformance.** Temporary structures and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure public health, safety and general welfare.

❖ This section prescribes those categories of the code that must be complied with, despite the fact that the structure will be removed or the use discontinued some time in the future. These criteria are essential for measuring the safety of any structure or use, temporary or permanent; therefore, the application of these criteria to a temporary structure cannot be waived.

"Structural strength" refers to the ability of the temporary structure to resist anticipated live, environmental and dead loads (see Chapter 16). It also applies to anticipated live and dead loads imposed by a temporary use in an existing structure.

"Fire safety" provisions are those required by Chapters 7, 8 and 9 invoked by virtue of the structure's size, use or location on the property.

"Means of egress" refers to full compliance with Chapter 10.

"Accessibility" refers to full compliance with Chapter 11 for making buildings accessible to physically disabled persons, a requirement that is repeated in Section 1103.1.

"Light, ventilation and sanitary" requirements are those imposed by Chapter 12 of the code or applicable sections of the IPC or IMC.

**107.3 Temporary power.** The building official is authorized to give permission to temporarily supply and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the ICC *Electrical Code*.

❖ Commonly, the electrical service on most construction sites is installed and energized long before all of the wiring is completed. This procedure allows the power supply to be increased as construction demands; however, temporary permission is not intended to waive the requirements set forth in the *International Code Council Electrical Code Administrative Provisions* or NFPA 70. Construction power from the permanent wiring of the building does not require the installation of temporary ground-fault circuit-interrupter (GFCI) protection or the assured equipment grounding program, because the building wiring installed as required by the code should be as safe for use during construction as it would be for use after completion of the building.

**107.4 Termination of approval.** The building official is authorized to terminate such permit for a temporary structure or use and to order the temporary structure or use to be discontinued.

❖ This section provides the building official with the necessary authority to terminate the permit for a temporary structure or use. The building official can order that a temporary structure be removed or a temporary use be discontinued if conditions of the permit have been violated or the structure or use poses an imminent hazard to the public, in which case the provisions of Section 115 become applicable. This text is important because it allows the building official to act quickly when time is of the essence in order to protect public health, safety and welfare.

## SECTION 108 FEES

**108.1 Payment of fees.** A permit shall not be valid until the fees prescribed by law have been paid, nor shall an amendment to a permit be released until the additional fee, if any, has been paid.

❖ The code anticipates that jurisdictions will establish their own fee schedules. It is the intent that the fees collected by the department for building permit issuance, plan review and inspection be adequate to cover the costs to the department in these areas. If the department has additional duties, then its budget will need to be supplemented from the general fund. This section requires that all fees be paid prior to permit issuance or release of an amendment to a permit. Since department operations are intended to be supported by fees paid by the user of department activities, it is important that these fees are received before incurring any expense. This philosophy has resulted in some

departments having fees paid prior to the performance of two areas of work: plan review and inspection.

**108.2 Schedule of permit fees.** On buildings, structures, electrical, gas, mechanical, and plumbing systems or alterations requiring a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

❖ The jurisdiction inserts its desired fee schedule at this location. The fees are established by law, such as in an ordinance adopting the code (see page v of the code for a sample), a separate ordinance or legally promulgated regulation, as required by state or local law. Fee schedules are often based on a valuation of the work to be performed. This concept is based on the proposition that the valuation of a project is related to the amount of work to be expended in plan review, inspections and administering the permit, plus an excess to cover the department overhead.

To assist jurisdictions in establishing some uniformity in fees, building evaluation data are published periodically in ICC's *Building Safety Journal*.

**108.3 Building permit valuations.** The applicant for a permit shall provide an estimated permit value at time of application. Permit valuations shall include total value of work, including materials and labor, for which the permit is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. If, in the opinion of the building official, the valuation is underestimated on the application, the permit shall be denied, unless the applicant can show detailed estimates to meet the approval of the building official. Final building permit valuation shall be set by the building official.

❖ As indicated in Section 108.2, jurisdictions usually base their fees on the value of the work being performed. This section, therefore, requires the applicant to provide this figure, which is to include the total value of the work, including materials and labor, for which the permit is sought. If the building official believes that the value provided by the applicant is underestimated, the permit is to be denied unless the applicant can substantiate the value by providing detailed estimates of the work to the satisfaction of the building official. For the construction of new buildings, the building valuation data referred to in Section 108.2 can be used by the building official as a yardstick against which to compare the applicant's estimate.

**108.4 Work commencing before permit issuance.** Any person who commences any work on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits shall be subject to a fee established by the building official that shall be in addition to the required permit fees.

❖ The building official will incur certain costs (i.e., inspection time and administrative) when investigating and citing a person who has commenced work without having obtained a permit. The building official is, therefore, entitled to recover these costs by establishing a fee, in addition to that collected when the required permit is issued, to be imposed on the responsible party.

Note that this is not a penalty, as described in Section 113.4, for which the person can also be liable.

**108.5 Related fees.** The payment of the fee for the construction, alteration, removal or demolition for work done in connection to or concurrently with the work authorized by a building permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

❖ The fees for a building permit may be in addition to other fees required by the jurisdiction or others for related items, such as sewer connections, water service taps, driveways and signs. It cannot be construed that the building permit fee includes these other items.

**108.6 Refunds.** The building official is authorized to establish a refund policy.

❖ This section allows for a refund of fees, which may be full or partial, typically resulting from the revocation, abandonment or discontinuance of a building project for which a permit has been issued and fees have been collected. The refund of fees should be related to the cost of enforcement services not provided because of the termination of the project. The building official, when authorizing a fee refund, is authorizing the disbursement of public funds; therefore, the request for a refund must be in writing and for good cause.

## SECTION 109 INSPECTIONS

**109.1 General.** Construction or work for which a permit is required shall be subject to inspection by the building official and such construction or work shall remain accessible and exposed for inspection purposes until approved. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the permit applicant to cause the work to remain accessible and exposed for inspection purposes. Neither the building official nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

❖ The inspection function is one of the more important aspects of building department operations. This section authorizes the building official to inspect the work for which a permit has been issued and requires that the work to be inspected remain accessible to the building official until inspected and approved. Any expense incurred in removing or replacing material that conceals an item to be inspected is not the responsibility of the building official or the jurisdiction. As with the issuance of permits (see Section 105.4), approval as a result of an inspection is not a license to violate the code and an approval in violation of the code does not relieve the applicant from complying with the code and is not valid.



**109.2 Preliminary inspection.** Before issuing a permit, the building official is authorized to examine or cause to be examined buildings, structures and sites for which an application has been filed.

❖ The building official is granted authority to inspect the site before permit issuance. This may be necessary to verify existing conditions that impact the plan review and permit approval. This section provides the building official with the right-of-entry authority that otherwise does not occur until after the permit is issued (see Section 104.6).

**109.3 Required inspections.** The building official, upon notification, shall make the inspections set forth in Sections 109.3.1 through 109.3.10.

❖ The building official is required to verify that the building is constructed in accordance with the approved construction documents. It is the responsibility of the permit holder to notify the building official when the item is ready for inspection. The inspections that are necessary to provide such verification are listed in the following sections, with the caveat in Section 109.3.8 that inspections in addition to those listed here may be required depending on the work involved.

**109.3.1 Footing and foundation inspection.** Footing and foundation inspections shall be made after excavations for footings are complete and any required reinforcing steel is in place. For concrete foundations, any required forms shall be in place prior to inspection. Materials for the foundation shall be on the job, except where concrete is ready mixed in accordance with ASTM C 94, the concrete need not be on the job.

❖ It is necessary for the building official to inspect the soil upon which the footing or foundation is to be placed. This inspection also includes any reinforcing steel, concrete forms and materials to be used in the foundation, except for ready-mixed concrete that is prepared off site.

**109.3.2 Concrete slab and under-floor inspection.** Concrete slab and under-floor inspections shall be made after in-slab or under-floor reinforcing steel and building service equipment, conduit, piping accessories and other ancillary equipment items are in place, but before any concrete is placed or floor sheathing installed, including the subfloor.

❖ The building official must be able to inspect the soil and any required under-slab drainage, waterproofing or dampproofing material, as well as reinforcing steel, conduit, piping and other service equipment embedded in or installed below a slab prior to placing the concrete. Similarly, items installed below a floor system other than concrete must be inspected before they are concealed by the floor sheathing or subfloor.

**109.3.3 Lowest floor elevation.** In flood hazard areas, upon placement of the lowest floor, including the basement, and prior to further vertical construction, the elevation certification

required in Section 1612.5 shall be submitted to the building official.

❖ Where a structure is located in a flood hazard area, as established in Section 1612.3, the building official must be provided with certification that either the lowest floor elevation (for structures located in flood hazard areas not subject to high-velocity wave action) or the elevation of the lowest horizontal structural member (for structures located in flood hazard areas subject to high-velocity wave action) is in compliance with Section 1612. This certification must be submitted prior to any construction proceeding above this level.

**109.3.4 Frame inspection.** Framing inspections shall be made after the roof deck or sheathing, all framing, fireblocking and bracing are in place and pipes, chimneys and vents to be concealed are complete and the rough electrical, plumbing, heating wires, pipes and ducts are approved.

❖ This section requires that the building official be able to inspect the framing members, such as studs, joists, rafters and girders and other items, such as vents and chimneys, that will be concealed by wall construction. Rough electrical work, plumbing, heating wires, pipes and ducts must have already been approved in accordance with the applicable codes prior to this inspection.

**109.3.5 Lath and gypsum board inspection.** Lath and gypsum board inspections shall be made after lathing and gypsum board, interior and exterior, is in place, but before any plastering is applied or gypsum board joints and fasteners are taped and finished.

**Exception:** Gypsum board that is not part of a fire-resistance-rated assembly or a shear assembly.

❖ In order to verify that lath and gypsum board is properly attached to framing members, it is necessary for the building official to be able to conduct an inspection before the plaster or joint finish material is applied. This is required only for gypsum board that is part of either a fire-resistant assembly or a shear wall.

**109.3.6 Fire-resistant penetrations.** Protection of joints and penetrations in fire-resistance-rated assemblies shall not be concealed from view until inspected and approved.

❖ The building official must have an opportunity to inspect joint protection required by Section 713 and penetration protection required by Section 712 for fire-resistance-rated assemblies before they become concealed from view.

**109.3.7 Energy efficiency inspections.** Inspections shall be made to determine compliance with Chapter 13 and shall include, but not be limited to, inspections for: envelope insulation  $R$  and  $U$  values, fenestration  $U$  value, duct system  $R$  value, and HVAC and water-heating equipment efficiency.

❖ Items installed in a building that are required by the IECC to comply with certain criteria, such as insulation

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material, windows, HVAC and water-heating equipment, must be inspected and approved.

**109.3.8 Other inspections.** In addition to the inspections specified above, the building official is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department of building safety.

❖ Any item regulated by the code is subject to inspection by the building official to determine compliance with the applicable code provision, and no list can include all items in a given building. This section, therefore, gives the building official the authority to inspect any regulated items.

**109.3.9 Special inspections.** For special inspections, see Section 1704.

❖ Special inspections are to be provided by the owner for the types of work required in Section 1704. The building official is to approve special inspectors and verify that the required special inspections have been conducted. See the commentary to Section 1704 for a complete discussion of this topic.

**109.3.10 Final inspection.** The final inspection shall be made after all work required by the building permit is completed.

❖ Upon completion of the work for which the permit has been issued and before issuance of the certificate of occupancy required by Section 110.3, a final inspection is to be made. All violations of the approved construction documents and permit are to be noted and the holder of the permit is to be notified of the discrepancies.

**109.4 Inspection agencies.** The building official is authorized to accept reports of approved inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

❖ As an alternative to the building official conducting the inspection, he or she is permitted to accept inspections of and reports by approved inspection agencies. Appropriate criteria on which to base approval of inspection agencies can be found in Section 1703.

**109.5 Inspection requests.** It shall be the duty of the holder of the building permit or their duly authorized agent to notify the building official when work is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

❖ It is the responsibility of the permit holder or other authorized person, such as the contractor performing the work, to arrange for the required inspections when completed work is ready and to allow for sufficient time for the building official to schedule a visit to the site to prevent work from being concealed prior to being inspected. Access to the work to be inspected must be provided, including any special means such as a ladder.

**109.6 Approval required.** Work shall not be done beyond the point indicated in each successive inspection without first

obtaining the approval of the building official. The building official, upon notification, shall make the requested inspections and shall either indicate the portion of the construction that is satisfactory as completed, or notify the permit holder or his or her agent wherein the same fails to comply with this code. Any portions that do not comply shall be corrected and such portion shall not be covered or concealed until authorized by the building official.

❖ This section establishes that work cannot progress beyond the point of a required inspection without the building official's approval. Upon making the inspection, the building official must either approve the completed work or notify the permit holder or other responsible party of that which does not comply with the code. Approvals and notices of noncompliance must be in writing, as required by Section 104.4, to avoid any misunderstanding as to what is required. Any item not approved cannot be concealed until it has been corrected and approved by the building official.

## SECTION 110 CERTIFICATE OF OCCUPANCY

**110.1 Use and occupancy.** No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion thereof shall be made until the building official has issued a certificate of occupancy therefor as provided herein. Issuance of a certificate of occupancy shall not be construed as an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction.

❖ This section establishes that a new building or structure cannot be occupied until a certificate of occupancy is issued by the building official, which reflects the conclusion of the work allowed by the building permit. Also, no change in occupancy of an existing building is permitted without first obtaining a certificate of occupancy for the new use.

The tool that the building official uses to control the uses and occupancies of various buildings and structures within the jurisdiction is the certificate of occupancy. It is unlawful to use or occupy a building or structure unless a certificate of occupancy has been issued. Its issuance does not relieve the building owner from the responsibility for correcting any code violation that may exist.

**110.2 Certificate issued.** After the building official inspects the building or structure and finds no violations of the provisions of this code or other laws that are enforced by the department of building safety, the building official shall issue a certificate of occupancy that contains the following:

1. The building permit number.
2. The address of the structure.
3. The name and address of the owner.
4. A description of that portion of the structure for which the certificate is issued.

5. A statement that the described portion of the structure has been inspected for compliance with the requirements of this code for the occupancy and division of occupancy and the use for which the proposed occupancy is classified.
  6. The name of the building official.
  7. The edition of the code under which the permit was issued.
  8. The use and occupancy, in accordance with the provisions of Chapter 3.
  9. The type of construction as defined in Chapter 6.
  10. The design occupant load.
  11. If an automatic sprinkler system is provided, whether the sprinkler system is required.
  12. Any special stipulations and conditions of the building permit.
- ❖ The building official is required to issue a certificate of occupancy after a successful final inspection has been completed and all deficiencies and violations have been resolved. This section lists the information that must be included on the certificate. This information is useful to both the building official and the owner because it indicates the criteria under which the structure was evaluated and approved at the time the certificate was issued. This is important when applying Chapter 34 to existing buildings.

**110.3 Temporary occupancy.** The building official is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely. The building official shall set a time period during which the temporary certificate of occupancy is valid.

- ❖ The building official is permitted to issue a temporary certificate of occupancy for all or a portion of a building prior to the completion of all work. Such certification is to be issued only when the building or portion in question can be safely occupied prior to full completion. The certification is intended to acknowledge that some building features may not be completed even though the building is safe for occupancy, or that a portion of the building can be safely occupied while work continues in another area. This provision precludes the occupancy of a building or structure that does not contain all of the required fire protection systems and means of egress. Temporary certificates should be issued only when incidental construction remains, such as site work and interior work that is not regulated by the code and exterior decoration not necessary to the integrity of the building envelope. The building official should view the issuance of a temporary certificate of occupancy as substantial an act as the issuance of the final certificate. Indeed, the issuance of a temporary certificate of occupancy offers a greater potential for conflict because once the building or structure is occupied, it is very difficult to remove the occupants through legal

means. The certificate must specify the time period for which it is valid.

**110.4 Revocation.** The building official is authorized to, in writing, suspend or revoke a certificate of occupancy or completion issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the building or structure or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.

- ❖ The building official is authorized to, in writing, suspend or revoke a certificate of occupancy or completion issued under the provisions of this code wherever the certificate is issued in error, on the basis of incorrect information supplied, or where it is determined that the building or structure or portion thereof is in violation of any ordinance, regulation or any of the provisions of this code.

This section is needed to give the building official the authority to revoke a certificate of occupancy for the reasons indicated in the code text. The building official may also suspend the certificate of occupancy until all of the code violations are corrected.

## SECTION 111 SERVICE UTILITIES

**111.1 Connection of service utilities.** No person shall make connections from a utility, source of energy, fuel or power to any building or system that is regulated by this code for which a permit is required, until released by the building official.

- ❖ This section establishes the authority of the building official to approve utility connections to a building for items such as water, sewer, electricity, gas and steam, and to require their disconnection when hazardous conditions or emergencies exist.

The approval of the building official is required before a connection can be made from a utility to a building system that is regulated by the code, including those referenced in Section 101.4. This includes utilities supplying water, sewer, electricity, gas and steam services. For the protection of building occupants, including workers, such systems must have had final inspection approvals, except as allowed by Section 111.2 for temporary connections.

**111.2 Temporary connection.** The building official shall have the authority to authorize the temporary connection of the building or system to the utility source of energy, fuel or power.

- ❖ The building official is permitted to issue temporary authorization to make connections to the public utility system prior to the completion of all work. This acknowledges that, because of seasonal limitations, time constraints or the need for testing or partial operation of equipment, some building systems may be safely connected even though the building is not suitable for final occupancy. The temporary connection and utilization of connected equipment should be approved when the requesting permit holder has demon-



strated to the building official's satisfaction that public health, safety and welfare will not be endangered.

**111.3 Authority to disconnect service utilities.** The building official shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the codes referenced in case of emergency where necessary to eliminate an immediate hazard to life or property. The building official shall notify the serving utility, and wherever possible the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

❖ Disconnection of one or more of a building's utility services is the most radical method of hazard abatement available to the building official and should be reserved for cases in which all other lesser remedies have proven ineffective. Such an action must be preceded by written notice to the utility and the owner and occupants of the building. Disconnection must be accomplished within the time frame established by the building official in the notice. When the hazard to the public health, safety or welfare is so imminent as to mandate immediate disconnection, the building official has the authority and even the obligation to cause disconnection without notice. In such cases, the owner or occupants must be given written notice as soon as possible.

## SECTION 112 BOARD OF APPEALS

**112.1 General.** In order to hear and decide appeals of orders, decisions or determinations made by the building official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business.

❖ This section provides an aggrieved party with a material interest in the decision of the building official a process to appeal such a decision before a board of appeals. This provides a forum, other than the court of jurisdiction, in which to review the building official's actions.

This section literally allows any person to appeal a decision of the building official. In practice, this section has been interpreted to permit appeals only by those aggrieved parties with a material or definitive interest in the decision of the building official. An aggrieved party may not appeal a code requirement per se. The intent of the appeal process is not to waive or set aside a code requirement; rather, it is intended to provide a means of reviewing a building official's decision on an interpretation or application of the code or to review the equivalency of protection to the code requirements. The members of the appeals board are appointed by the "governing body" of the jurisdiction, typically a council or administrator, such as a mayor or

city manager, and remain members until removed from office. The board must establish procedures for electing a chairperson, scheduling and conducting meetings and administration. Note that Appendix B contains complete, detailed requirements for creating an appeals board, including number of members, qualifications and administrative procedures. Jurisdictions desiring to utilize these requirements must include Appendix B in their adopting ordinance.

**112.2 Limitations on authority.** An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.

❖ This section establishes the grounds for an appeal, which claims that the building official has misinterpreted or misapplied a code provision. The board is not allowed to set aside any of the technical requirements of the code; however, it is allowed to consider alternative methods of compliance with the technical requirements (see Section 104.11).

**112.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction.

❖ It is important that the decisions of the appeals board are based purely on the technical merits involved in an appeal. It is not the place for policy or political deliberations. The members of the appeals board are, therefore, expected to have experience in building construction matters. Appendix B provides more detailed qualifications for appeals board members and can be adopted by jurisdictions desiring that level of expertise.

## SECTION 113 VIOLATIONS

**113.1 Unlawful acts.** It shall be unlawful for any person, firm or corporation to erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or equipment regulated by this code, or cause same to be done, in conflict with or in violation of any of the provisions of this code.

❖ Violations of the code are prohibited and form the basis for all citations and correction notices.

**113.2 Notice of violation.** The building official is authorized to serve a notice of violation or order on the person responsible for the erection, construction, alteration, extension, repair, moving, removal, demolition or occupancy of a building or structure in violation of the provisions of this code, or in violation of a permit or certificate issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.

❖ The building official is required to notify the person responsible for the erection or use of a building found to

be in violation of the code. The section that is allegedly being violated must be cited so that the responsible party can respond to the notice.

**113.3 Prosecution of violation.** If the notice of violation is not complied with promptly, the building official is authorized to request the legal counsel of the jurisdiction to institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful occupancy of the building or structure in violation of the provisions of this code or of the order or direction made pursuant thereto.

❖ The building official must pursue, through the use of legal counsel of the jurisdiction, legal means to correct the violation. This is not optional.

Any extensions of time, so that the violations may be corrected voluntarily, must be for a reasonable and valid cause or the building official may be subject to criticism for "arbitrary and capricious" actions. In general, it is better to have a standard time limitation for correction of violations. Departures from this standard must be for a clear and reasonable purpose, usually stated in writing by the violator.

**113.4 Violation penalties.** Any person who violates a provision of this code or fails to comply with any of the requirements thereof or who erects, constructs, alters or repairs a building or structure in violation of the approved construction documents or directive of the building official, or of a permit or certificate issued under the provisions of this code, shall be subject to penalties as prescribed by law.

❖ Penalties for violating provisions of the code are typically contained in state law, particularly if the code is adopted at that level, and the building department must follow those procedures. If there is no such procedure already in effect, one must be established with the aid of legal counsel.

## SECTION 114 STOP WORK ORDER

**114.1 Authority.** Whenever the building official finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the building official is authorized to issue a stop work order.

❖ This section provides for the suspension of work for which a permit was issued, pending the removal or correction of a severe violation or unsafe condition identified by the building official.

Normally, correction notices, issued in accordance with Section 109.6, are used to inform the permit holder of code violations. Stop work orders are issued when enforcement can be accomplished no other way or when a dangerous condition exists.

**114.2 Issuance.** The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the

conditions under which the cited work will be permitted to resume.

❖ Upon receipt of a violation notice from the building official, all construction activities identified in the notice must immediately cease, except as expressly permitted to correct the violation.

**114.3 Unlawful continuance.** Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to penalties as prescribed by law.

❖ This section states that the work in violation must terminate and that all other work, except that which is necessary to correct the violation or unsafe condition, must cease as well. As determined by the municipality or state, a penalty may be assessed for failure to comply with this section.

## SECTION 115 UNSAFE STRUCTURES AND EQUIPMENT

**115.1 Conditions.** Structures or existing equipment that are or hereafter become unsafe, insanitary or deficient because of inadequate means of egress facilities, inadequate light and ventilation, or which constitute a fire hazard, or are otherwise dangerous to human life or the public welfare, or that involve illegal or improper occupancy or inadequate maintenance, shall be deemed an unsafe condition. Unsafe structures shall be taken down and removed or made safe, as the building official deems necessary and as provided for in this section. A vacant structure that is not secured against entry shall be deemed unsafe.

❖ This section describes the responsibility of the building official to investigate reports of unsafe structures and equipment and provides criteria for such determination.

Unsafe structures are defined as buildings or structures that are insanitary; deficient in light and ventilation or adequate exit facilities; constitute a fire hazard or are otherwise dangerous to human life.

This section establishes that unsafe buildings can result from illegal or improper occupancies. For example, prima facie evidence of an unsafe structure is an unsecured (open at door or window) vacant building. All unsafe buildings must either be demolished or made safe and secure as deemed appropriate by the building official.

**115.2 Record.** The building official shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition.

❖ The building official must file a report on each investigation of unsafe conditions, stating the occupancy of the structure and the nature of the unsafe condition. This report provides the basis for the notice described in Section 115.3.



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**115.3 Notice.** If an unsafe condition is found, the building official shall serve on the owner, agent or person in control of the structure, a written notice that describes the condition deemed unsafe and specifies the required repairs or improvements to be made to abate the unsafe condition, or that requires the unsafe structure to be demolished within a stipulated time. Such notice shall require the person thus notified to declare immediately to the building official acceptance or rejection of the terms of the order.

- ❖ The building official must file a report on each investigation of unsafe conditions, stating the occupancy of the structure and the nature of the unsafe condition. This report provides the basis for the notice described in Section 115.3.

**115.4 Method of service.** Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

- ❖ The notice must be delivered personally to the owner. If the owner or agent cannot be located, additional procedures are established, including posting the unsafe notice on the premises in question. Such action may be considered the equivalent of personal notice; however, it may or may not be deemed by the courts as representing a "good faith" effort to notify. In addition to complying with this section, therefore, public notice through the use of newspapers and other postings in a prominent location at the government center should be used.

**115.5 Restoration.** The structure or equipment determined to be unsafe by the building official is permitted to be restored to a safe condition. To the extent that repairs, alterations or additions are made or a change of occupancy occurs during the restoration of the structure, such repairs, alterations, additions or change of occupancy shall comply with the requirements of Section 105.2.2 and Chapter 34.

- ❖ This section provides that unsafe structures may be restored to a safe condition. This means that the cause of the unsafe structure notice can be abated without the structure being required to comply fully with the provisions for new construction. Any work done to eliminate the unsafe condition, as well as any change in occupancy that may occur, must comply with the code.

## Bibliography

The following resource materials are referenced in this chapter or are relevant to the subject matter addressed in this chapter.

*Legal Aspects of Code Administration.* Country Club Hills, IL: International Code Council, 2002.

NFPA 14-00, *Standpipe and Hose Systems.* Quincy, MA: National Fire Protection Association, 2000.

NFPA 70-02, *National Electrical Code.* Quincy, MA: National Fire Protection Association, 2002.

NFPA 409-95, *Standard on Aircraft.* Quincy, MA: National Fire Protection Association, 1995.

*Readings in Code Administration, Volume 1: History/Philosophy/Law.* Country Club Hills, IL: Building Officials and Code Administrators International, Inc., 1974.

# Chapter 2: Definitions

## General Comments

All terms defined in the code are listed alphabetically in Chapter 2. The actual definitions of the terms are located as follows:

Where a term is used in more than one chapter, its definition appears in Chapter 2. Of the more than 500 words, terms and phrases defined in the code, over 40 are defined in Chapter 2.

Where a term is unique or primarily pertains to a single chapter, its definition appears within that chapter. In many chapters, the second section is devoted to definitions. For example, definitions applicable to means of egress are found in Section 1002.

Where a term is unique to a single section or subsection of a chapter, its definition appears within that section or subsection. For example, definitions applicable to stages and platforms are found in Section 410.2 (see Section 410).

## Purpose

Codes, by their very nature, are technical documents. As such, literally every word, term and punctuation mark can add to or change the meaning of the intended result. This is even more so with a performance-based code where the desired result often takes on more importance than the specific words. Furthermore, the code, with its broad scope of applicability, includes terms inherent in a variety of construction disciplines. These terms often have multiple meanings depending on the context or discipline being used at the time. For these reasons, it is necessary to maintain a consensus on the specific meaning of terms contained in the code. Chapter 2 performs this function by stating clearly what specific terms mean for the purpose of the code.

## SECTION 201 GENERAL

❖ This section contains language and provisions that are supplemental to the use of Chapter 2. It gives guidance to the use of the defined words relevant to tense, gender and plurality. Finally, this section provides direction on how to apply terms that are not defined in the code.

**201.1 Scope.** Unless otherwise expressly stated, the following words and terms shall, for the purposes of this code, have the meanings shown in this chapter.

❖ The use of words and terms in the code is governed by the provisions of this section. This includes code-defined terms as well as those terms that are not.

**201.2 Interchangeability.** Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

❖ While the definitions contained or referenced in Chapter 2 are to be taken literally, gender and tense are interchangeable.

**201.3 Terms defined in other codes.** Where terms are not defined in this code and are defined in the *International Fuel Gas Code*, *International Fire Code*, *International Mechanical Code* or *International Plumbing Code*, such terms shall have the meanings ascribed to them as in those codes.

❖ Definitions that are applicable in other *International Codes*<sup>®</sup> are applicable everywhere the term is used in

the code. Definitions of terms can help in the understanding and application of code requirements.

**201.4 Terms not defined.** Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.

❖ Words or terms not defined within the *International Code* series are intended to be applied based on their "ordinarily accepted meanings." The intent of this statement is that a dictionary definition may suffice, provided it is in context. Oftentimes, construction terms used throughout the code are not specifically defined in the code or even in a dictionary. In such a case, the definitions contained in the referenced standards (see Chapter 35) and published textbooks on the subject in question are good resources.

## SECTION 202 DEFINITIONS

❖ This portion of the commentary addresses only those terms whose definitions appear in Chapter 2. The commentary for definitions that are located elsewhere in the code can be found in the indicated sections that contain those definitions.

**AAC MASONRY.** See Section 2102.1.

**ACCESSIBLE.** See Section 1102.1.

**ACCESSIBLE MEANS OF EGRESS.** See Section 1002.1.

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**ACCESSIBLE ROUTE.** See Section 1102.1.

**ACCESSIBLE UNIT.** See Section 1102.1.

**ACCREDITATION BODY.** See Section 2302.1.

**ADDITION.** An extension or increase in floor area or height of a building or structure.

- ❖ This term is used to describe the condition when the floor area or height of an existing building or structure is increased (see Chapter 34). This term is only applicable to existing buildings, never new ones.

**ADHERED MASONRY VENEER.** See Section 1402.1.

**ADOBE CONSTRUCTION.** See Section 2102.1.

**Adobe, stabilized.** See Section 2102.1.

**Adobe, unstabilized.** See Section 2102.1.

**[F] AEROSOL.** See Section 307.2.

**Level 1 aerosol products.** See Section 307.2.

**Level 2 aerosol products.** See Section 307.2.

**Level 3 aerosol products.** See Section 307.2.

**[F] AEROSOL CONTAINER.** See Section 307.2.

**AGRICULTURAL, BUILDING.** A structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products. This structure shall not be a place of human habitation or a place of employment where agricultural products are processed, treated or packaged, nor shall it be a place used by the public.

- ❖ This definition is needed for the proper application of the utility and miscellaneous occupancy group provisions. The use of the building is quite restricted such that buildings that include habitable or public spaces are not agricultural buildings by definition.

**AIR-INFLATED STRUCTURE.** See Section 3102.2.

**AIR-SUPPORTED STRUCTURE.** See Section 3102.2.

**Double skin.** See Section 3102.2.

**Single skin.** See Section 3102.2.

**AISLE.** See Section 1002.1.

**AISLE ACCESSWAY.** See Section 1002.1.

**[F] ALARM NOTIFICATION APPLIANCE.** See Section 902.1.

**[F] ALARM SIGNAL.** See Section 902.1.

**[F] ALARM VERIFICATION FEATURE.** See Section 902.1.

**ALLOWABLE STRESS DESIGN.** See Section 1602.1.

**ALTERATION.** Any construction or renovation to an existing structure other than repair or addition.

- ❖ The code utilizes this term to reflect construction operations intended for an existing building (see Chapter 34), but not within the scope of an addition or repair (see the definitions of "Addition" and "Repair").

**ALTERNATING TREAD DEVICE.** See Section 1002.1.

**ANCHOR.** See Section 2102.1.

**ANCHOR BUILDING.** See Section 402.2.

**ANCHORED MASONRY VENEER.** See Section 1402.1.

**ANNULAR SPACE.** See Section 702.1.

**[F] ANNUNCIATOR.** See Section 902.1.

**APPROVED.** Acceptable to the code official or authority having jurisdiction.

- ❖ As related to the process of acceptance of building installations, including materials, equipment and construction systems, this definition identifies where ultimate authority rests. Whenever this term is used, it intends that only the enforcing authority can accept a specific installation or component as complying with the code.

**APPROVED AGENCY.** See Section 1702.1.

**APPROVED FABRICATOR.** See Section 1702.1.

**APPROVED SOURCE.** An independent person, firm or corporation, approved by the building official, who is competent and experienced in the application of engineering principles to materials, methods or systems analyses.

- ❖ The building official sometimes needs to rely on evaluation reports, analyses or other types of reports that purport to validate the use of a material, system or method as complying with the code. This definition establishes that the building official needs to rely on independent, competent individuals or agencies as the source of these reports.

**ARCHITECTURAL TERRA COTTA.** See Section 2102.1.

**AREA.** See Section 2102.1.

**Bedded.** See Section 2102.1.

**Gross cross-sectional.** See Section 2102.1.

**Net cross-sectional.** See Section 2102.1.

**AREA, BUILDING.** See Section 502.1.

**AREA OF REFUGE.** See Section 1002.1.

**AREAWAY.** A subsurface space adjacent to a building open at the top or protected at the top by a grating or guard.

- ❖ Areaways are often constructed to provide access to below-grade building services, including transformers, ventilation shafts and pipe tunnels.

**ASSISTED LIVING FACILITIES.** See Section 310.2, "Residential Care/Assisted living facilities."

**ASSISTED LIVING FACILITIES**

**ATRIUM.** See Section 404.1.1.

**ATTIC.** The space between the ceiling beams of the top story and the roof rafters.

- ❖ The definition of "Attic" identifies the specific portion of a building or structure for the purposes of determining the applicability of requirements that are specific to attics, such as ventilation (see Section 1202) and draftstopping (see Section 716). Additionally, the code has access requirements (see Section 1208) and uniformly distributed live load requirements (see Table

1607.1) for attics. An attic is considered the space or area located immediately below the roof sheathing within the roof framing system of a building. Pitched roof systems, such as gabled, hip, sawtoothed or curved roofs, all create spaces between the roof sheathing and ceiling membrane, which are considered attics.

**[F] AUDIBLE ALARM NOTIFICATION APPLIANCE.** See Section 902.1.

**AUTOCLAVED AERATED CONCRETE (AAC).** See Section 2102.1.

**[F] AUTOMATIC.** See Section 902.1.

**[F] AUTOMATIC FIRE-EXTINGUISHING SYSTEM.** See Section 902.1.

**[F] AUTOMATIC SPRINKLER SYSTEM.** See Section 902.1.

**[F] AVERAGE AMBIENT SOUND LEVEL.** See Section 902.1

**AWNING.** An architectural projection that provides weather protection, identity or decoration and is wholly supported by the building to which it is attached. An awning is comprised of a lightweight, rigid skeleton structure over which a covering is attached.

❖ Similar to a canopy, an awning typically provides weather protection, signage or decoration. But unlike a canopy, an awning relies solely on the building to which it is attached for its means of support. See Section 3105 for general requirements, Section 1607.11 for awning design loads and Section 3202 for encroachment requirements.

**BACKING.** See Section 1402.1.

**BALCONY, EXTERIOR.** See Section 1602.1.

**BALED COTTON.** See Section 307.2.

**BALED COTTON, DENSELY PACKED.** See Section 307.2.

**[F] BARRICADE.** See Section 307.2.

**Artificial barricade.** See Section 307.2.

**Natural barricade.** See Section 307.2.

**BASE FLOOD.** See Section 1612.2.

**BASE FLOOD ELEVATION.** See Section 1612.2.

**BASEMENT.** See Sections 502.1 and 1612.2.

❖ A basement is a level within a building that has its floor surface below the adjoining ground level. Often due to grading conditions, a basement will also be considered as a story above grade, thereby contributing to the building height (see the commentary to the definition of "Story above grade plane").

**BED JOINT.** See Section 2102.1.

**BLEACHERS.** See Section 1002.1.

**BOARDING HOUSE.** See Section 310.2.

**[F] BOILING POINT.** See Section 307.2.

**BOND BEAM.** See Section 2102.1.

**BOND REINFORCING.** See Section 2102.1.

**BRACED WALL LINE.** See Section 2302.1.

**BRACED WALL PANEL.** See Section 2302.1.

**BRICK.** See Section 2102.1.

**Calcium silicate (sand lime brick).** See Section 2102.1.

**Clay or shale.** See Section 2102.1.

**Concrete.** See Section 2102.1.

**BUILDING.** Any structure used or intended for supporting or sheltering any use or occupancy.

❖ The code uses this term to identify those structures that provide shelter for a function or activity.

**BUILDING LINE.** The line established by law, beyond which a building shall not extend, except as specifically provided by law.

❖ This term defines the limitations or boundaries for construction of a building. This line is typically established by a zoning statute or rights-of-way dedication and is not specified in the code.

**BUILDING OFFICIAL.** The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

❖ The statutory power to enforce the code is normally vested in a building department (or the like) of a state, county or municipality that has a designated enforcement officer termed the "building official" (see Section 103.1).

**BUILT-UP ROOF COVERING.** See Section 1502.1.

**BUTTRESS.** See Section 2102.1.

**CABLE-RESTRAINED, AIR-SUPPORTED STRUCTURE.** See Section 3102.2.

**CANOPY.** An architectural projection that provides weather protection, identity or decoration and is supported by the building to which it is attached and at the outer end by not less than one stanchion. A canopy is comprised of a rigid structure over which a covering is attached.

❖ A canopy is an architectural projection comprised of a rigid structure over which a membrane covering is typically attached providing weather protection, a means of identity or decoration. It is supported by both the building to which it is attached and no less than one stanchion. See Section 3105 for general requirements, Section 1607.11 for design loads and Section 3202 for encroachment requirements.

**[F] CARBON DIOXIDE EXTINGUISHING SYSTEMS.** See Section 902.1.

**CAST STONE.** See Section 2102.1.

**[F] CEILING LIMIT.** See Section 902.1.

**CEILING RADIATION DAMPER.** See Section 702.1.

**CELL.** See Section 2102.1.

**CEMENT PLASTER.** See Section 2502.1.



**CERAMIC FIBER BLANKET.** See Section 721.1.1.

**CERTIFICATE OF COMPLIANCE.** See Section 1702.1.

**CHIMNEY.** See Section 2102.1.

**CHIMNEY TYPES.** See Section 2102.1.

**High-heat appliance type.** See Section 2102.1.

**Low-heat appliance type.** See Section 2102.1.

**Masonry type.** See Section 2102.1.

**Medium-heat appliance type.** See Section 2102.1.

**CIRCULATION PATH.** See Section 1102.1.

**[F] CLEAN AGENT.** See Section 902.1.

**CLEANOUT.** See Section 2102.1.

**[F] CLOSED SYSTEM.** See Section 307.2.

**COLLAR JOINT.** See Section 2102.1.

**COLLECTOR.** See Section 2302.1.

**COLUMN, MASONRY.** See Section 2102.1.

**COMBINATION FIRE/SMOKE DAMPER.** See Section 702.1.

**[F] COMBUSTIBLE DUST.** See Section 307.2.

**[F] COMBUSTIBLE FIBERS.** See Section 307.2.

**[F] COMBUSTIBLE LIQUID.** See Section 307.2.

**Class II.** See Section 307.2.

**Class IIIA.** See Section 307.2.

**Class IIIB.** See Section 307.2.

**COMMON PATH OF EGRESS TRAVEL.** See Section 1002.1.

**COMMON USE.** See Section 1102.1.

**COMPOSITE ACTION.** See Section 2102.1.

**COMPOSITE MASONRY.** See Section 2102.1.

**[F] COMPRESSED GAS.** See Section 307.2.

**COMPRESSIVE STRENGTH OF MASONRY.** See Section 2102.1.

**CONCRETE, CARBONATE AGGREGATE.** See Section 721.1.1.

**CONCRETE, CELLULAR.** See Section 721.1.1.

**CONCRETE, LIGHTWEIGHT AGGREGATE.** See Section 721.1.1.

**CONCRETE, PERLITE.** See Section 721.1.1.

**CONCRETE, SAND-LIGHTWEIGHT.** See Section 721.1.1.

**CONCRETE, SILICEOUS AGGREGATE.** See Section 721.1.1.

**CONCRETE, VERMICULITE.** See Section 721.1.1.

**CONGREGATE LIVING FACILITIES.** See Section 310.2.

**CONNECTOR.** See Section 2102.1.

**[F] CONSTANTLY ATTENDED LOCATION.** See Section 902.1.

**CONSTRUCTION DOCUMENTS.** Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit.

❖ To determine whether or not proposed construction is in compliance with code requirements, it is necessary that sufficient information be submitted to the building official for review. This typically consists of the drawings (floor plans, elevations, sections, details, etc.), specifications and product information describing the proposed work.

**CONSTRUCTION TYPES.** See Section 602.

**Type I.** See Section 602.2.

**Type II.** See Section 602.2.

**Type III.** See Section 602.3.

**Type IV.** See Section 602.4.

**Type V.** See Section 602.5.

**[F] CONTINUOUS GAS-DETECTION SYSTEM.** See Section 415.2.

**[F] CONTROL AREA.** See Section 307.2.

**CONTROLLED LOW-STRENGTH MATERIAL.** A self-compacted, cementitious material used primarily as a backfill in place of compacted fill.

❖ The definition provided is from ACI 229R-99, *Controlled Low-Strength Materials*. This type of material is known by many "local" names (e.g., flowable fill) and is commonly used in lieu of a compacted backfill. Requirements for its use under the code are outlined in Section 1803.6.

**CONVENTIONAL LIGHT-FRAME WOOD CONSTRUCTION.** See Section 2302.1.

**CORRIDOR.** See Section 1002.1.

**CORROSION RESISTANCE.** The ability of a material to withstand deterioration of its surface or its properties when exposed to its environment.

❖ There are different environments that contain different types of materials to which building construction materials are exposed. "Corrosion resistance" is not an absolute term; it is relative to the building material and where it is being used. For instance, certain types of plastic polymers might resist corrosion when used in an exterior environment, but might not be resistant to corrosion from certain chemical gases that could be present in a laboratory.

**[F] CORROSIVE.** See Section 307.2.

**COURT.** An open, uncovered space, unobstructed to the sky, bounded on three or more sides by exterior building walls or other enclosing devices.

❖ Though not specifically identified in the definition, the provisions in the code for courts are only applicable to those areas created by the arrangement of exterior walls and used to provide natural light or ventilation

(see Section 1205.3 and the definition of "Yard" at the end of this section).

**COVER.** See Section 2102.1.

**COVERED MALL BUILDING.** See Section 402.2.

**CRIPPLE WALL.** See Section 2302.1.

**CRYOGENIC FLUID.** See Section 307.2.

**DALLE GLASS.** See Section 2402.1.

**DAMPER.** See Section 702.1.

**DAY BOX.** See Section 307.2.

**DEAD LOADS.** See Section 1602.1.

**DECK.** See Section 1602.1.

**DECORATIVE GLASS.** See Section 2402.1.

**[F] DECORATIVE MATERIALS.** All materials applied over the building interior finish for decorative, acoustical or other effect (such as curtains, draperies, fabrics, streamers and surface coverings), and all other materials utilized for decorative effect (such as batting, cloth, cotton, hay, stalks, straw, vines, leaves, trees, moss and similar items), including foam plastics and materials containing foam plastics. Decorative materials do not include floor coverings, ordinary window shades, interior finish and materials 0.025 inch (0.64 mm) or less in thickness applied directly to and adhering tightly to a substrate.

❖ The significance of this definition is really to provide information as to what is *not* regulated as decorative materials in the application of code requirements. While any dictionary definition would consider floor coverings, window shades and wall paper to fall into the category of "decorative" in a building interior, they are not considered decorative materials for the flame-resistance testing to which the code requirements are intended to apply.

**[F] DEFLAGRATION.** See Section 307.2.

**[F] DELUGE SYSTEM.** See Section 902.1.

**DESIGN DISPLACEMENT.** See Section 1908.1.3.

**DESIGN EARTHQUAKE GROUND MOTION.** See Section 1613.2.

**DESIGN FLOOD.** See Section 1612.2.

**DESIGN FLOOD ELEVATION.** See Section 1612.2.

**DESIGN STRENGTH.** See Section 1602.1.

**DESIGNATED SEISMIC SYSTEM.** See Section 1702.1.

**[F] DETACHED BUILDING.** See Section 307.2.

**DETAILED PLAIN CONCRETE STRUCTURAL WALL.** See Section 1908.1.3.

**DETECTABLE WARNING.** See Section 1102.1.

**[F] DETECTOR, HEAT.** See Section 902.1.

**[F] DETONATION.** See Section 307.2.

**DIAPHRAGM.** See Sections 1602.1 and 2102.1.

**Diaphragm, blocked.** See Sections 1602.1.

**Diaphragm, boundary.** See Section 1602.1.

**Diaphragm, chord.** See Section 1602.1.

**Diaphragm, flexible.** See Section 1602.1.

**Diaphragm, rigid.** See Section 1602.1.

**Diaphragm, unblocked.** See Section 2302.1.

**DIMENSIONS.** See Section 2102.1.

**Actual.** See Section 2102.1.

**Nominal.** See Section 2102.1.

**Specified.** See Section 2102.1.

**DISPENSING.** See Section 307.2.

**DOOR, BALANCED.** See Section 1002.1.

**DORMITORY.** See Section 310.2.

**DRAFTSTOP.** See Section 702.1.

**DRAG STRUT.** See Section 2302.1.

**[F] DRY-CHEMICAL EXTINGUISHING AGENT.** See Section 902.1.

**DRY FLOODPROOFING.** See Section 1612.2.

**DURATION OF LOAD.** See Section 1602.1.

**DWELLING.** A building that contains one or two dwelling units used, intended or designed to be used, rented, leased, let or hired out to be occupied for living purposes.

❖ Dwellings are buildings intended to serve as residences for one or two families. Dwellings can be owner occupied or rented. The term "dwelling," which refers to the building itself, is defined to distinguish it from the term "dwelling unit," which is a single living unit within a building. It is important to recognize that the code is not intended to regulate detached one- and two-family dwellings and townhouses that are no more than three stories in height. These dwellings are regulated by the *International Residential Code*® (IRC®) (see Section 101.2).

**DWELLING UNIT.** A single unit providing complete, independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

❖ A dwelling unit, as stated, is a residential unit that contains all of the necessary facilities for independent living. This provides a single, independent *unit* that serves a single family or single group of individuals. This terminology is used where separation issues are required for two or more units under one roof, or for the description of the separation of a garage from a dwelling unit. A building containing one or more dwelling units is a "dwelling." See the definition above for "Dwelling."

**DWELLING UNIT OR SLEEPING UNIT, MULTI-STORY.** See Section 1102.1.

**DWELLING UNIT OR SLEEPING UNIT, TYPE A.** See Section 1102.1.

**DWELLING UNIT OR SLEEPING UNIT, TYPE B.** See Section 1102.1.

**EFFECTIVE HEIGHT.** See Section 2102.1.

**EGRESS COURT.** See Section 1002.1.

**[F] EMERGENCY ALARM SYSTEM.** See Section 902.1.

**[F] EMERGENCY CONTROL STATION.** See Section 415.2.

**EMERGENCY ESCAPE AND RESCUE OPENING.** See Section 1002.1.

**[F] EMERGENCY VOICE/ALARM COMMUNICATIONS.** See Section 902.1.

**EMPLOYEE WORK AREA.** See Section 1102.1.

**EQUIPMENT PLATFORM.** See Section 502.1.

**ESSENTIAL FACILITIES.** See Section 1602.1.

**[F] EXHAUSTED ENCLOSURE.** See Section 415.2.

**EXISTING CONSTRUCTION.** See Section 1612.2.

**EXISTING STRUCTURE.** A structure erected prior to the date of adoption of the appropriate code, or one for which a legal building permit has been issued. See also Section 1612.2.

❖ This term is used to identify those structures or buildings that were constructed before the current edition of the code was adopted by the jurisdiction. Often erected under the provisions of an earlier edition of the code, the buildings are exempt from compliance with current code provisions, unless otherwise stated, a hazardous condition is present or when significant alterations or changes in building heights and areas are being made. Applicability of the code to existing buildings is clearly identified in Chapter 34 (see commentary, Chapter 34).

**EXIT.** See Section 1002.1.

**EXIT, HORIZONTAL.** See Section 1002.1.

**EXIT ACCESS.** See Section 1002.1.

**EXIT DISCHARGE.** See Section 1002.1.

**EXIT DISCHARGE, LEVEL OF.** See Section 1002.1.

**EXIT ENCLOSURE.** See Section 1002.1.

**EXIT PASSAGEWAY.** See Section 1002.1.

**EXPANDED VINYL WALL COVERING.** See Section 802.1.

**[F] EXPLOSION.** See Section 902.1.

**[F] EXPLOSIVE.** See Section 307.2.

**High explosive.** See Section 307.2.

**Low explosive.** See Section 307.2.

**Mass detonating explosives.** See Section 307.2.

**UN/DOTn Class 1 Explosives.** See Section 307.2.

**Division 1.1.** See Section 307.2.

**Division 1.2.** See Section 307.2.

**Division 1.3.** See Section 307.2.

**Division 1.4.** See Section 307.2.

**Division 1.5.** See Section 307.2.

**Division 1.6.** See Section 307.2.

**EXTERIOR SURFACES.** See Section 2502.1.

**EXTERIOR WALL.** See Section 1402.1.

**EXTERIOR WALL COVERING.** See Section 1402.1.

**EXTERIOR WALL ENVELOPE.** See Section 1402.1.

**F RATING.** See Section 702.1.

**FABRIC PARTITIONS.** See Section 1602.1.

**FABRICATED ITEM.** See Section 1702.1.

**[F] FABRICATION AREA.** See Section 415.2.

**FACILITY.** See Section 1102.1.

**FACTORED LOAD.** See Section 1602.1.

**FIBER CEMENT SIDING.** See Section 1402.1.

**FIBERBOARD.** See Section 2302.1.

**FIRE ALARM BOX, MANUAL.** See Section 902.1.

**[F] FIRE ALARM CONTROL UNIT.** See Section 902.1.

**[F] FIRE ALARM SIGNAL.** See Section 902.1.

**[F] FIRE ALARM SYSTEM.** See Section 902.1.

**FIRE AREA.** See Section 702.1.

**FIRE BARRIER.** See Section 702.1.

**[F] FIRE COMMAND CENTER.** See Section 902.1.

**FIRE DAMPER.** See Section 702.1.

**[F] FIRE DETECTOR, AUTOMATIC.** See Section 902.1.

**FIRE DOOR.** See Section 702.1.

**FIRE DOOR ASSEMBLY.** See Section 702.1.

**FIRE EXIT HARDWARE.** See Section 1002.1.

**[F] FIRE LANE.** A road or other passageway developed to allow the passage of fire apparatus. A fire lane is not necessarily intended for vehicular traffic other than fire apparatus.

❖ The term "fire lane" is synonymous with the term "fire apparatus access road," both being a road that provides access from a fire station to a building, or portion thereof. However, it should be noted that the driving surface is not necessarily the same as that provided for a public road. The driving surface must be a surface that can be shown to adequately support the load of anticipated emergency vehicles.

**FIRE PARTITION.** See Section 702.1.

**FIRE PROTECTION RATING.** See Section 702.1.

**[F] FIRE PROTECTION SYSTEM.** See Section 902.1.

**FIRE RESISTANCE.** See Section 702.1.

**FIRE-RESISTANCE RATING.** See Section 702.1.

**FIRE-RESISTANT JOINT SYSTEM.** See Section 702.1.

**[F] FIRE SAFETY FUNCTIONS.** See Section 902.1.

**FIRE SEPARATION DISTANCE.** See Section 702.1.

- FIRE WALL.** See Section 702.1.
- FIRE WINDOW ASSEMBLY.** See Section 702.1.
- FIREBLOCKING.** See Section 702.1.
- FIREPLACE.** See Section 2102.1.
- FIREPLACE THROAT.** See Section 2102.1.
- FIREWORKS.** See Section 307.2.
- FIREWORKS, 1.3G.** See Section 307.2.
- FIREWORKS, 1.4G.** See Section 307.2.
- FLAME SPREAD.** See Section 802.1.
- FLAME SPREAD INDEX.** See Section 802.1.
- [F] FLAMMABLE GAS.** See Section 307.2.
- [F] FLAMMABLE LIQUEFIED GAS.** See Section 307.2.
- [F] FLAMMABLE LIQUID.** See Section 307.2.
- Class IA.** See Section 307.2.
- Class IB.** See Section 307.2.
- Class IC.** See Section 307.2.
- [F] FLAMMABLE MATERIAL.** See Section 307.2.
- [F] FLAMMABLE SOLID.** See Section 307.2.
- [F] FLAMMABLE VAPORS OR FUMES.** See Section 415.2.
- [F] FLASH POINT.** See Section 307.2.
- FLEXURAL LENGTH.** See Section 1808.1.
- FLOOD OR FLOODING.** See Section 1612.2.
- FLOOD DAMAGE-RESISTANT MATERIALS.** See Section 1612.2.
- FLOOD HAZARD AREA.** See Section 1612.2.
- FLOOD HAZARD AREA SUBJECT TO HIGH VELOCITY WAVE ACTION.** See Section 1612.2.
- FLOOD INSURANCE RATE MAP (FIRM).** See Section 1612.2.
- FLOOD INSURANCE STUDY.** See Section 1612.2.
- FLOODWAY.** See Section 1612.2.
- FLOOR AREA, GROSS.** See Section 1002.1.
- FLOOR AREA, NET.** See Section 1002.1.
- FLOOR FIRE DOOR ASSEMBLY.** See Section 702.1.
- FLY GALLERY.** See Section 410.2.
- [F] FOAM-EXTINGUISHING SYSTEMS.** See Section 902.1.
- FOAM PLASTIC INSULATION.** See Section 2602.1.
- FOLDING AND TELESCOPIC SEATING.** See Section 1002.1.
- FOOD COURT.** See Section 402.2.
- FOUNDATION PIER.** See Section 2102.1.
- [F] GAS CABINET.** See Section 415.2.
- [F] GAS ROOM.** See Section 415.2.
- [F] GASEOUS HYDROGEN SYSTEM.** See Section 420.2.
- GLASS FIBERBOARD.** See Section 721.1.1.
- GLUED BUILT-UP MEMBER.** See Section 2302.1.
- GRADE FLOOR OPENING.** A window or other opening located such that the sill height of the opening is not more than 44 inches (1118 mm) above or below the finished ground level adjacent to the opening.
- ❖ Openings used for emergency escape or emergency rescue are clearly easier to use the closer they are to grade. This definition specifies that the maximum sill height above the exterior adjacent grade must be no more than 44 inches (1118 mm) for an opening to qualify as a grade floor opening.
- GRADE (LUMBER).** See Section 2302.1.
- GRADE PLANE.** See Section 502.1.
- GRANDSTAND.** See Section 1002.1.
- GRIDIRON.** See Section 410.2.
- GROSS LEASABLE AREA.** See Section 402.2.
- GROUTED MASONRY.** See Section 2102.1.
- Grouted hollow-unit masonry.** See Section 2102.1.
- Grouted multiwythe masonry.** See Section 2102.1.
- GUARD.** See Section 1002.1.
- GYPSUM BOARD.** See Section 2502.1.
- GYPSUM PLASTER.** See Section 2502.1.
- GYPSUM VENEER PLASTER.** See Section 2502.1.
- HABITABLE SPACE.** A space in a building for living, sleeping, eating or cooking. Bathrooms, toilet rooms, closets, halls, storage or utility spaces and similar areas are not considered habitable spaces.
- ❖ These spaces are normally considered inhabited in the course of residential living and provide the four basic characteristics associated with it: living, sleeping, eating and cooking. All habitable spaces are considered occupiable spaces, though other occupiable spaces, such as halls or utility rooms, are not considered habitable (see the definition of "Occupiable space" in this chapter).
- [F] HALOGENATED EXTINGUISHING SYSTEMS.** See Section 902.1.
- [F] HANDLING.** See Section 307.2.
- HANDRAIL.** See Section 1002.1.
- HARDBOARD.** See Section 2302.1.
- [F] HAZARDOUS MATERIALS.** See Section 307.2.
- [F] HAZARDOUS PRODUCTION MATERIAL (HPM).** See Section 415.2.
- HEAD JOINT.** See Section 2102.1.
- HEADER (Bonder).** See Section 2102.1.
- [F] HEALTH HAZARD.** See Section 307.2.
- HEIGHT, BUILDING.** See Section 502.1.



**HEIGHT, STORY.** See Section 502.1.

**HEIGHT, WALLS.** See Section 2102.1.

**HELIPORT.** See Section 412.5.1.

**HELISTOP.** See Section 412.5.1.

**[F] HIGHLY TOXIC.** See Section 307.2.

**HISTORIC BUILDINGS.** Buildings that are listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate state or local law (see Sections 3407 and 3409.9).

❖ The code provides a subjective blanket exception for compliance in Section 3406 to those “true” historic buildings that are receiving improvements or undergoing changes of any kind. This definition specifies the criteria for consideration as a historic building.

**HORIZONTAL ASSEMBLY.** See Section 702.1.

**[F] HPM FLAMMABLE LIQUID.** See Section 415.2.

**[F] HPM ROOM.** See Section 415.2.

**HURRICANE-PRONE REGIONS.** See Section 1609.2.

**[F] HYDROGEN CUTOFF ROOM.** See Section 420.2.

**IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH).** See Section 415.2.

**IMPACT LOAD.** See Section 1602.1.

**INCOMPATIBLE MATERIALS.** See Section 307.2.

**[F] INITIATING DEVICE.** See Section 902.1.

**INSPECTION CERTIFICATE.** See Section 1702.1.

**INTENDED TO BE OCCUPIED AS A RESIDENCE.** See Section 1102.1.

**INTERIOR FINISH.** See Section 802.1.

**INTERIOR FLOOR FINISH.** See Section 802.1.

**INTERIOR SURFACES.** See Section 2502.1.

**INTERIOR WALL AND CEILING FINISH.** See Section 802.1.

**INTERLAYMENT.** See Section 1502.1.

**JOINT.** See Section 702.1.

**JURISDICTION.** The governmental unit that has adopted this code under due legislative authority.

❖ The governmental unit adopting the code has the legal authority to do so under state statutes.

**LABEL.** See Section 1702.1.

**LIGHT-DIFFUSING SYSTEM.** See Section 2602.1.

**LIGHT-FRAME CONSTRUCTION.** A type of construction whose vertical and horizontal structural elements are primarily formed by a system of repetitive wood or light gage steel framing members.

❖ The code uses the term “light frame” to distinguish this unique type of framing system from other structural systems. The structural integrity of light-frame construction is dependent upon numerous connections or frequent bracing. Other framing systems or terms

commonly used in the building industry that are considered as light-frame construction include: “stick built,” “post and beam,” “pole barn,” “platform frame,” “western frame” and “balloon frame.” Sections 2205 and 2211 pertain to light-frame cold-formed steel construction. Section 2308 defines a specific subcategory of light-frame construction called “Conventional light-frame wood construction,” which is limited to wood materials.

**LIGHT-TRANSMITTING PLASTIC ROOF PANELS.** See Section 2602.1.

**LIGHT-TRANSMITTING PLASTIC WALL PANELS.** See Section 2602.1.

**LIMIT STATE.** See Section 1602.1.

**[F] LIQUID.** See Section 415.2.

**[F] LIQUID STORAGE ROOM.** See Section 415.2.

**[F] LIQUID USE, DISPENSING AND MIXING ROOMS.** See Section 415.2.

**LISTED.** See Section 902.1.

**LIVE LOADS.** See Section 1602.1.

**LIVE LOADS (ROOF).** See Section 1602.1.

**LOAD AND RESISTANCE FACTOR DESIGN (LRFD).** See Section 1602.1.

**LOAD EFFECTS.** See Section 1602.1.

**LOAD FACTOR.** See Section 1602.1.

**LOADS.** See Section 1602.1.

**LOT.** A portion or parcel of land considered as a unit.

❖ A lot is a legally recorded parcel of land, the boundaries of which are described on a deed. When code requirements are based on some element of a lot (such as yard area or lot line location), it is the physical attributes of the parcel of land that the code is addressing, not issues of ownership. Adjacent lots owned by the same party are treated as if they were owned by different parties because ownership can change at any time. A condominium form of building ownership does not create separate lots (i.e., parcels of land) and such unit owners are treated as separate tenants, not separate lot owners.

**LOT LINE.** A line dividing one lot from another, or from a street or any public place.

❖ Lot lines are legally recorded divisions between two adjacent land parcels or lots. They are the reference point for the location of buildings for exterior separation and other code purposes (see the definition of “Lot” above).

**[F] LOWER FLAMMABLE LIMIT (LFL).** See Section 415.2.

**LOWEST FLOOR.** See Section 1612.2.

**MAIN WINDFORCE-RESISTING SYSTEM.** See Section 1702.1.

**MALL.** See Section 402.2.

**[F] MANUAL FIRE ALARM BOX.** See Section 902.1.

**MANUFACTURER'S DESIGNATION.** See Section 1702.1.

**MARK.** See Section 1702.1.

**MARQUEE.** A permanent roofed structure attached to and supported by the building and that projects into the public right-of-way.

❖ Marquees, unlike canopies and awnings, are fixed, permanent structures that justify sufficiently different requirements from those for other projections (see Section 3106 for code requirements for marquees).

**MASONRY.** See Section 2102.1.

**Ashlar masonry.** See Section 2102.1.

**Coursed ashlar.** See Section 2102.1.

**Glass unit masonry.** See Section 2102.1.

**Plain masonry.** See Section 2102.1.

**Random ashlar.** See Section 2102.1.

**Reinforced masonry.** See Section 2102.1.

**Solid masonry.** See Section 2102.1.

**Unreinforced (plain) masonry.** See Section 2102.1.

**MASONRY UNIT.** See Section 2102.1.

**Clay.** See Section 2102.1.

**Concrete.** See Section 2102.1.

**Hollow.** See Section 2102.1.

**Solid.** See Section 2102.1.

**MAXIMUM CONSIDERED EARTHQUAKE GROUND MOTION.** See Section 1613.2.

**MEAN DAILY TEMPERATURE.** See Section 2102.1.

**MEANS OF EGRESS.** See Section 1002.1.

**MECHANICAL-ACCESS OPEN PARKING GARAGES.** See Section 406.3.2.

**MECHANICAL EQUIPMENT SCREEN.** See Section 1502.1.

**MECHANICAL SYSTEMS.** See Section 1613.2.

**MEMBRANE-COVERED CABLE STRUCTURE.** See Section 3102.2.

**MEMBRANE-COVERED FRAME STRUCTURE.** See Section 3102.2.

**MEMBRANE PENETRATION.** See Section 702.1.

**MEMBRANE-PENETRATION FIRESTOP.** See Section 702.1.

**MERCHANDISE PAD.** See Section 1002.1.

**METAL COMPOSITE MATERIAL (MCM).** See Section 1402.1.

**METAL COMPOSITE MATERIAL (MCM) SYSTEM.** See Section 1402.1.

**METAL ROOF PANEL.** See Section 1502.1.

**METAL ROOF SHINGLE.** See Section 1502.1.

**MEZZANINE.** See Section 502.1.

**MICROPILES.** See Section 1808.1.

**MINERAL BOARD.** See Section 721.1.1.

**MINERAL FIBER.** See Section 702.1.

**MINERAL WOOL.** See Section 702.1.

**MODIFIED BITUMEN ROOF COVERING.** See Section 1502.1.

**MORTAR.** See Section 2102.1.

**MORTAR, SURFACE-BONDING.** See Section 2102.1.

**MULTILEVEL ASSEMBLY SEATING.** See Section 1102.1.

**[F] MULTIPLE-STATION ALARM DEVICE.** See Section 902.1.

**[F] MULTIPLE-STATION SMOKE ALARM.** See Section 902.1.

**MULTISTORY UNITS.** See Section 1102.1.

**NAILING, BOUNDARY.** See Section 2302.1.

**NAILING, EDGE.** See Section 2302.1.

**NAILING, FIELD.** See Section 2302.1.

**NATURALLY DURABLE WOOD.** See Section 2302.1.

**Decay resistant.** See Section 2302.1.

**Termite resistant.** See Section 2302.1.

**NOMINAL LOADS.** See Section 1602.1.

**NOMINAL SIZE (LUMBER).** See Section 2302.1.

**NONCOMBUSTIBLE MEMBRANE STRUCTURE.** See Section 3102.2.

**[F] NORMAL TEMPERATURE AND PRESSURE (NTP).** See Section 415.2.

**NOSING.** See Section 1002.1.

**[F] NUISANCE ALARM.** See Section 902.1.

**OCCUPANCY CATEGORY.** See Section 1602.1.

**OCCUPANT LOAD.** See Section 1002.1.

**OCCUPIABLE SPACE.** A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes or in which occupants are engaged at labor, and which is equipped with means of egress and light and ventilation facilities meeting the requirements of this code.

❖ Occupiable spaces are those areas designed for human occupancy. Based on the nature of the occupancy, various code sections apply. All habitable spaces are also considered occupiable (see the definition of "Habitable space"); however, all occupiable spaces are not habitable. Additionally, some spaces are neither habitable nor occupiable, such as closets, toilet rooms and mechanical equipment rooms.

**OPEN PARKING GARAGE.** See Section 406.3.2.

**[F] OPEN SYSTEM.** See Section 307.2.

**OPERATING BUILDING.** See Section 307.2.

**ORDINARY PRECAST STRUCTURAL WALL.** See Section 1908.1.3.

**ORDINARY REINFORCED CONCRETE STRUCTURAL WALL.** See Section 1908.1.3.

**ORDINARY STRUCTURAL PLAIN CONCRETE WALL.** See Section 1908.1.3.

**[F] ORGANIC PEROXIDE.** See Section 307.2.

**Class I.** See Section 307.2.

**Class II.** See Section 307.2.

**Class III.** See Section 307.2.

**Class IV.** See Section 307.2.

**Class V.** See Section 307.2.

**Unclassified detonable.** See Section 307.2.

**ORTHOGONAL.** See Section 1613.2.

**OTHER STRUCTURES.** See Section 1602.1.

**OWNER.** Any person, agent, firm or corporation having a legal or equitable interest in the property.

❖ This term defines the person or other legal entity who is responsible for a building and its compliance with the code requirements.

**[F] OXIDIZER.** See Section 307.2.

**Class 4.** See Section 307.2.

**Class 3.** See Section 307.2.

**Class 2.** See Section 307.2.

**Class 1.** See Section 307.2.

**[F] OXIDIZING GAS.** See Section 307.2.

**PANEL (PART OF A STRUCTURE).** See Section 1602.1.

**PANIC HARDWARE.** See Section 1002.1.

**PARTICLEBOARD.** See Section 2302.1.

**PENETRATION FIRESTOP.** See Section 702.1.

**PENTHOUSE.** See Section 1502.1.

**PERMIT.** An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity.

❖ The permit constitutes a license issued by the building official to proceed with a specific activity, such as construction of a building, in accordance with all applicable laws.

**PERSON.** An individual, heirs, executors, administrators or assigns, and also includes a firm, partnership or corporation, its or their successors or assigns, or the agent of any of the aforesaid.

❖ Corporations and other organizations listed in the definition are treated as persons under the law. Also, when the code provides for a penalty (see Section 113.4), the definition makes it clear that the individuals

responsible for administering the activities of these various organizations are subject to these penalties.

**PERSONAL CARE SERVICE.** See Section 310.2.

**[F] PHYSICAL HAZARD.** See Section 307.2.

**[F] PHYSIOLOGICAL WARNING THRESHOLD LEVEL.** See Section 415.2.

**PIER FOUNDATIONS.** See Section 1808.1.

**Belled piers.** See Section 1808.1.

**PILE FOUNDATIONS.** See Section 1808.1.

**Auger uncased piles.** See Section 1808.1.

**Caisson piles.** See Section 1808.1.

**Concrete-filled steel pipe and tube piles.** See Section 1808.1.

**Driven uncased piles.** See Section 1808.1.

**Enlarged base piles.** See Section 1808.1.

**Steel-cased piles.** See Section 1808.1.

**Timber piles.** See Section 1808.1.

**PINRAIL.** See Section 410.2.

**PLASTIC, APPROVED.** See Section 2602.1.

**PLASTIC GLAZING.** See Section 2602.1.

**PLASTIC HINGE.** See Section 2102.1.

**PLATFORM.** See Section 410.2.

**POSITIVE ROOF DRAINAGE.** See Section 1502.1.

**PREFABRICATED WOOD I-JOIST.** See Section 2302.1.

**PRESERVATIVE-TREATED WOOD.** See Section 2302.1.

**PRESTRESSED MASONRY.** See Section 2102.1.

**PRIMARY FUNCTION.** See Section 3402.1.

**PRISM.** See Section 2102.1.

**PROSCENIUM WALL.** See Section 410.2.

**PUBLIC ENTRANCE.** See Section 1102.1.

**PUBLIC-USE AREAS.** See Section 1102.1.

**PUBLIC WAY.** See Section 1002.1.

**[F] PYROPHORIC.** See Section 307.2.

**[F] PYROTECHNIC COMPOSITION.** See Section 307.2.

**RAMP.** See Section 1002.1.

**RAMP-ACCESS OPEN PARKING GARAGES.** See Section 406.3.2.

**[F] RECORD DRAWINGS.** See Section 902.1.

**REFERENCE RESISTANCE (*D*).** See Section 2302.1.

**REGISTERED DESIGN PROFESSIONAL.** An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

❖ Legal qualifications for engineers and architects are established by the state having jurisdiction. Licensing



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and registration of engineers and architects are accomplished by written or oral examinations offered by states or by reciprocity (licensing in other states).

**REINFORCED PLASTIC, GLASS FIBER.** See Section 2602.1.

**RELIGIOUS WORSHIP, PLACE OF.** A building or portion thereof intended for the performance of religious services.

❖ This term has been added to the code for the purpose of making the code more broadly applicable to the worship facilities of all religions. Major religions for the world include Christianity, Islam, Hinduism, Buddhism and Judaism and an *International Code* should not show bias in terminology that is based on the most common faith in its country of origin. The intent in the code is for the same application for all similar types of religious facilities. The term also makes it clear that it defines the room or sanctuary for the performance of religious worship services and not retreat complexes, rectories, convents and classroom or office areas.

**REPAIR.** The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.

❖ As indicated in Section 105.2.2, the repair of an item typically does not require a permit. This definition makes it clear that repair is limited to work on the item, and does not include complete or substantial replacement or other new work.

**REQUIRED STRENGTH.** See Sections 1602.1 and 2102.1.

**REROOFING.** See Section 1502.1.

**RESIDENTIAL AIRCRAFT HANGAR.** See Section 412.3.1.

**RESIDENTIAL CARE/ASSISTED LIVING FACILITIES.** See Section 310.2.

**RESISTANCE FACTOR.** See Section 1602.1.

**RESTRICTED ENTRANCE.** See Section 1102.1.

**RETRACTABLE AWNING.** See Section 3105.2.

**ROOF ASSEMBLY.** See Section 1502.1.

**ROOF COVERING.** See Section 1502.1.

**ROOF COVERING SYSTEM.** See Section 1502.1.

**ROOF DECK.** See Section 1502.1.

**ROOF RECOVER.** See Section 1502.1.

**ROOF REPAIR.** See Section 1502.1.

**ROOF REPLACEMENT.** See Section 1502.1.

**ROOF VENTILATION.** See Section 1502.1.

**ROOFTOP STRUCTURE.** See Section 1502.1.

**RUBBLE MASONRY.** See Section 2102.1.

**Coursed rubble.** See Section 2102.1.

**Random rubble.** See Section 2102.1.

**Rough or ordinary rubble.** See Section 2102.1.

**RUNNING BOND.** See Section 2102.1.

**SCISSOR STAIR.** See Section 1002.1.

**SCUPPER.** See Section 1502.1.

**SEISMIC DESIGN CATEGORY.** See Section 1613.2.

**SEISMIC-FORCE-RESISTING SYSTEM.** See Section 1613.2.

**SELF-CLOSING.** See Section 702.1.

**SELF-SERVICE STORAGE FACILITY.** See Section 1102.1.

**[F] SERVICE CORRIDOR.** See Section 415.2.

**SERVICE ENTRANCE.** See Section 1102.1.

**SHAFT.** See Section 702.1.

**SHAFT ENCLOSURE.** See Section 702.1.

**SHEAR WALL.** See Sections 2102.1 and 2302.1.

**Detailed plain masonry shear wall.** See Section 2102.1.

**Intermediate prestressed masonry shear wall.** See Section 2102.1.

**Intermediate reinforced masonry shear wall.** See Section 2102.1.

**Ordinary plain masonry shear wall.** See Section 2102.1.

**Ordinary plain prestressed masonry shear wall.** See Section 2102.1.

**Ordinary reinforced masonry shear wall.** See Section 2102.1.

**Perforated shear wall.** See Section 2302.1.

**Perforated shear wall segment.** See Section 2302.1.

**Special prestressed masonry shear wall.** See Section 2102.1.

**Special reinforced masonry shear wall.** See Section 2102.1.

**SHELL.** See Section 2102.1.

**SINGLE-PLY MEMBRANE.** See Section 1502.1.

**[F] SINGLE-STATION SMOKE ALARM.** See Section 902.1.

**SITE.** See Section 1102.1.

**SITE CLASS.** See Section 1613.2.

**SITE COEFFICIENTS.** See Section 1613.2.

**SKYLIGHT, UNIT.** A factory-assembled, glazed fenestration unit, containing one panel of glazing material that allows for natural lighting through an opening in the roof assembly while preserving the weather-resistant barrier of the roof.

❖ This is a specific type of sloped glazing assembly that is factory assembled. The code and the IRC contain specific provisions that are appropriate for this type of building component. Factory assembled units, as opposed to site-built skylights, can be designed, tested and rated as one component that incorporates both glazing and framing, if applicable. The individual components of site-built glazing must be designed to resist

the design loads of the codes individually, and are not usually rated as an assembly.

**SKYLIGHTS AND SLOPED GLAZING.** Glass or other transparent or translucent glazing material installed at a slope of 15 degrees (0.26 rad) or more from vertical. Glazing material in skylights, including unit skylights, solariums, sunrooms, roofs and sloped walls, are included in this definition.

❖ The code regulates skylights and sloped glazing since their failure could result in injury and building damage (see Section 2405 for the code requirements).

**SLEEPING UNIT.** A room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a dwelling unit are not sleeping units.

❖ This definition is included to coordinate the *Fair Housing Act Guidelines* with the code. The definition for "Sleeping unit" is needed to clarify the differences between sleeping units and dwelling units. Some examples would be a hotel guestroom, a dormitory, a boarding house, etc. Another example would be an addition to a studio apartment with a kitchenette (i.e., microwave, sink, refrigerator). Since the cooking arrangements were not permanent, this configuration would be considered a sleeping unit, not a dwelling unit. As already defined in the code, a dwelling unit must contain permanent facilities for living, sleeping, eating, cooking and sanitation.

[F] **SMOKE ALARM.** See Section 902.1.

**SMOKE BARRIER.** See Section 702.1.

**SMOKE COMPARTMENT.** See Section 702.1.

**SMOKE DAMPER.** See Section 702.1.

[F] **SMOKE DETECTOR.** See Section 902.1.

**SMOKE-DEVELOPED INDEX.** See Section 802.1.

**SMOKE-PROTECTED ASSEMBLY SEATING.** See Section 1002.1.

**SMOKEPROOF ENCLOSURE.** See Section 902.1.

[F] **SOLID.** See Section 415.2.

**SPECIAL INSPECTION.** See Section 1702.1.

**Special inspection, continuous.** See Section 1702.1.

**Special inspection, periodic.** See Section 1702.1.

**SPECIAL FLOOD HAZARD AREA.** See Section 1612.2.

**SPECIFIED.** See Section 2102.1.

**SPECIFIED COMPRESSIVE STRENGTH OF MASONRY ( $f'_m$ ).** See Section 2102.1.

**SPLICE.** See Section 702.1.

**SPRAYED FIRE-RESISTANT MATERIALS.** See Section 1702.1.

**STACK BOND.** See Section 2102.1.

**STAGE.** See Section 410.2.

**STAIR.** See Section 1002.1.

**STAIRWAY.** See Section 1002.1.

**STAIRWAY, EXTERIOR.** See Section 1002.1.

**STAIRWAY, INTERIOR.** See Section 1002.1.

**STAIRWAY, SPIRAL.** See Section 1002.1.

[F] **STANDPIPE SYSTEM, CLASSES OF.** See Section 902.1.

**Class I system.** See Section 902.1.

**Class II system.** See Section 902.1.

**Class III system.** See Section 902.1.

[F] **STANDPIPE, TYPES OF.** See Section 902.1.

**Automatic dry.** See Section 902.1.

**Automatic wet.** See Section 902.1.

**Manual dry.** See Section 902.1.

**Manual wet.** See Section 902.1.

**Semiautomatic dry.** See Section 902.1.

**START OF CONSTRUCTION.** See Section 1612.2.

**STEEL CONSTRUCTION, COLD-FORMED.** See Section 2202.1.

**STEEL JOIST.** See Section 2202.1.

**STEEL MEMBER, STRUCTURAL.** See Section 2202.1.

**STEEP SLOPE.** A roof slope greater than two units vertical in 12 units horizontal (17-percent slope).

❖ This is the general criterion for roof slope that is used throughout the code. Slope requirements for specific roof covering materials are specified in Chapter 15.

**STONE MASONRY.** See Section 2102.1.

**Ashlar stone masonry.** See Section 2102.1.

**Rubble stone masonry.** See Section 2102.1.

[F] **STORAGE, HAZARDOUS MATERIALS.** See Section 415.2.

**STORY.** That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above (also see "Mezzanine" and Section 502.1). It is measured as the vertical distance from top to top of two successive tiers of beams or finished floor surfaces and, for the topmost story, from the top of the floor finish to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.

❖ All levels in a building that conform to this description are stories, including basements. A mezzanine is considered part of the story in which it is located. See Chapter 5 for code requirements regarding limitations on the number of stories in a building as a function of the type of construction. See Section 1617 for limits on story drift from earthquake effects.

**STORY ABOVE GRADE PLANE.** Any story having its finished floor surface entirely above grade plane, except that a

basement shall be considered as a story above grade plane where the finished surface of the floor above the basement is:

1. More than 6 feet (1829 mm) above grade plane; or
2. More than 12 feet (3658 mm) above the finished ground level at any point.

❖ The determination of a story above grade is important because it contributes to the height of a building for the purpose of applying the allowable building height in stories from Tables 503 and 1018.2. Every story with the finished floor entirely above grade (finished ground level) is a story above grade; however, a story with any portion of the finished floor level below grade is by definition a basement, and must be evaluated in conformance to the two criteria for story above grade. These two criteria are intended to deal with unusual grading of ground adjacent to exterior walls. Without such a consideration, the resulting building height can be reduced because of a berm or other landscaping technique that may be artificially created to reduce the apparent building height. The specific criteria establish the point at which a basement extends far enough above ground that it contributes to the regulated height of the building in number of stories.

**STRENGTH.** See Section 2102.1.

**Design strength.** See Section 2102.1.

**Nominal strength.** See Sections 1602.1 and 2102.1.

**Required strength.** See Sections 1602.1 and 2102.1.

**STRENGTH DESIGN.** See Section 1602.1.

**STRUCTURAL COMPOSITE LUMBER.** See Section 2302.1.

**Laminated veneer lumber (LVL).** See Section 2302.1.

**Parallel strand lumber (PSL).** See Section 2302.1.

**STRUCTURAL GLUED-LAMINATED TIMBER.** See Section 2302.1.

**STRUCTURAL OBSERVATION.** See Section 1702.1.

**STRUCTURE.** That which is built or constructed.

❖ This definition is intentionally broad so as to include within its scope, and therefore the scope of the code (see Section 101.2), everything that is built as an improvement to real property.

**SUBDIAPHRAGM.** See Section 2302.1.

**SUBSTANTIAL DAMAGE.** See Section 1612.2.

**SUBSTANTIAL IMPROVEMENT.** See Section 1612.2.

**SUNROOM ADDITION.** See Section 1202.1.

**[F] SUPERVISING STATION.** See Section 902.1.

**[F] SUPERVISORY SERVICE.** See Section 902.1.

**[F] SUPERVISORY SIGNAL.** See Section 902.1.

**[F] SUPERVISORY SIGNAL-INITIATING DEVICE.** See Section 902.1.

**SWIMMING POOLS.** See Section 3109.2.

**T RATING.** See Section 702.1.

**TECHNICALLY INFEASIBLE.** See Section 3402.

**TENT.** Any structure, enclosure or shelter which is constructed of canvas or pliable material supported in any manner except by air or the contents it protects.

❖ Tents can be temporary or permanent structures. When permanent, they are considered membrane-covered structures and are regulated by Section 3102. When erected as temporary enclosures, they are regulated by Section 3103.

**THERMAL ISOLATION.** See Section 1202.1.

**THERMOPLASTIC MATERIAL.** See Section 2602.1.

**THERMOSETTING MATERIAL.** See Section 2602.1.

**THIN-BED MORTAR.** See Section 2102.1.

**THROUGH PENETRATION.** See Section 702.1.

**THROUGH-PENETRATION FIRESTOP SYSTEM.** See Section 702.1.

**TIE-DOWN (HOLD-DOWN).** See Section 2302.1.

**TIE, LATERAL.** See Section 2102.1.

**TIE, WALL.** See Section 2102.1.

**TILE.** See Section 2102.1.

**TILE, STRUCTURAL CLAY.** See Section 2102.1.

**[F] TIRES, BULK STORAGE OF.** See Section 902.1.

**TOWNHOUSE.** A single-family dwelling unit constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides.

❖ This specific configuration of construction is called different things in different parts of the country, such as a "rowhouse." The term needs to be called out, as this specific configuration of multiple dwelling units is addressed in the scope of the IRC as well, regulating a townhouse that is three stories or less.

**[F] TOXIC.** See Section 307.2.

**TRANSIENT.** See Section 310.2.

**TREATED WOOD.** See Section 2302.1.

**TRIM.** See Section 802.1.

**[F] TROUBLE SIGNAL.** See Section 902.1.

**TYPE A UNIT.** See Section 1102.1.

**TYPE B UNIT.** See Section 1102.1.

**UNDERLAYMENT.** See Section 1502.1.

**[F] UNSTABLE (REACTIVE) MATERIAL.** See Section 307.2.

**Class 4.** See Section 307.2.

**Class 3.** See Section 307.2.

**Class 2.** See Section 307.2.

**Class 1.** See Section 307.2.

**[F] USE (MATERIAL).** See Section 415.2.



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**VAPOR-PERMEABLE MEMBRANE.** A material or covering having a permeance rating of 5 perms ( $52.9 \times 10^{-10}$  kg/Pa · s · m<sup>2</sup>) or greater, when tested in accordance with the desiccant method using Procedure A of ASTM E 96. A vapor-permeable material permits the passage of moisture vapor.

❖ Greater demands on the building envelope due to energy considerations now dictate the need for an outer membrane that reduces wind infiltration. The membranes used in this application may need to allow vapor to pass through it, given that a vapor barrier would be needed on the inside of the wall and would be undesirable on the outside of the wall. In such cases, a vapor-permeable membrane would be used.

**VAPOR RETARDER.** A vapor-resistant material, membrane or covering such as foil, plastic sheeting or insulation facing having a permeance rating of 1 perm ( $5.7 \times 10^{-11}$  kg/Pa · s · m<sup>2</sup>) or less, when tested in accordance with the desiccant method using Procedure A of ASTM E 96. Vapor retarders limit the amount of moisture vapor that passes through a material or wall assembly.

❖ This definition establishes the acceptance criteria and purpose of membranes used in building construction. This definition is important since the use of vapor retarders allows the required ventilation areas for attics and crawl spaces to be reduced. The transfer of less moisture from the interior building spaces into attics and crawl spaces decreases the need to ventilate the moisture in the attics or crawl spaces directly to the outside.

**VEHICLE BARRIER SYSTEM.** See Section 1602.1.

**VENEER.** See Section 1402.1.

**VENTILATION.** The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

❖ Ventilation is the process of moving air to or from building spaces. This definition is used in this chapter to establish minimum levels of air movement within a building for the purposes of providing a healthful interior environment. Ventilation would include both natural (openable exterior windows and doors for wind movement) and mechanical (forced air with mechanical equipment) methods.

**VINYL SIDING.** See Section 1402.1.

**[F] VISIBLE ALARM NOTIFICATION APPLIANCE.** See Section 902.1.

**WALKWAY, PEDESTRIAN.** A walkway used exclusively as a pedestrian trafficway.

❖ A pedestrian walkway is an enclosed passageway external to, and not considered part of, the buildings it connects. Intended only for pedestrian use, it can be at grade, below grade or elevated above grade.

**WALL.** See Section 2102.1.

**Cavity wall.** See Section 2102.1.

**Composite wall.** See Section 2102.1.

**Dry-stacked, surface-bonded wall.** See Section 2102.1.

**Masonry-bonded hollow wall.** See Section 2102.1.

**Parapet wall.** See Section 2102.1.

**WALL, LOAD-BEARING.** Any wall meeting either of the following classifications:

1. Any metal or wood stud wall that supports more than 100 pounds per linear foot (1459 N/m) of vertical load in addition to its own weight.
2. Any masonry or concrete wall that supports more than 200 pounds per linear foot (2919 N/m) of vertical load in addition to its own weight.

❖ This definition is necessary since the structural requirements and fire-resistance-rating requirements in this code vary for nonload-bearing walls and load-bearing walls. The term "load-bearing walls" are intended to refer to wall elements that support part of the structural framework of a building.

**WALL, NONLOAD-BEARING.** Any wall that is not a load-bearing wall.

❖ This definition is necessary since the structural requirements and fire-resistance-rating requirements in this code vary for nonload-bearing walls and load-bearing walls. Nonload-bearing walls do not support any portion of the building or structure except the weight of the wall itself.

**WALL PIER.** See Section 1908.1.3.

**[F] WATER-REACTIVE MATERIAL.** See Section 307.2.

**Class 3.** See Section 307.2.

**Class 2.** See Section 307.2.

**Class 1.** See Section 307.2.

**WATER-RESISTIVE BARRIER.** See Section 1402.

**WEATHER-EXPOSED SURFACES.** See Section 2502.1.

**WEB.** See Section 2102.1.

**[F] WET-CHEMICAL EXTINGUISHING SYSTEM.** See Section 902.1.

**WHEELCHAIR SPACE.** See Section 1102.1.

**WIND-BORNE DEBRIS REGION.** See Section 1609.2.

**WINDER.** See Section 1002.1.

**WIRE BACKING.** See Section 2502.1.

**[F] WIRELESS PROTECTION SYSTEM.** See Section 902.1.

**WOOD SHEAR PANEL.** See Section 2302.1.

**WOOD STRUCTURAL PANEL.** See Section 2302.1.

**Composite panels.** See Section 2302.1.

**Oriented strand board (OSB).** See Section 2302.1.

**Plywood.** See Section 2302.1.

**[F] WORKSTATION.** See Section 415.2.

**WYTHE.** See Section 2102.1.

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**YARD.** An open space, other than a court, unobstructed from the ground to the sky, except where specifically provided by this code, on the lot on which a building is situated.

❖ This definition is used, similar to the definition of "Court," to establish the applicability of code requirements when yards are utilized for natural light or natural ventilation purposes (see Section 1205.2). Whereas a court is bounded on three or more sides with the building or structure, a yard is bounded on two or less sides by the building or structure.

[F] **ZONE.** See Section 902.1.

### Bibliography

The following resource materials are referenced in this chapter or are relevant to the subject matter addressed in this chapter.

ACI Standard 222R-99, *Controlled Low-Strength Materials*. Farmington Hills, MI: American Concrete Institute, 1999.

IRC-2006, *International Residential Code*. Falls Church, VA: International Code Council, 2006.

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# Chapter 3: Use and Occupancy Classification

## General Comments

Chapter 3 provides for the classification of buildings, structures and parts thereof based on the purpose or purposes for which they are used.

Section 302 identifies the groups into which all buildings, structures and parts thereof must be classified.

Sections 303 through 312 identify the occupancy characteristics of each group classification. In some sections, specific group classifications having requirements in common are collectively organized such that one term applies to all. For example, Groups A-1, A-2, A-3, A-4 and A-5 are individual groups. The general term "Group A," however, includes each of these individual groups. For this reason, each specific assembly group classification is included in Section 303.

In the early years of building code development, the essence of regulatory safeguards from fire was to provide a reasonable level of protection to property. The idea was that if property was adequately protected from fire, then the building occupants would also be protected.

From this outlook on fire safety, the concept of equivalent risk has evolved in the code. This concept maintains that, in part, an acceptable level of risk against the damages of fire respective to a particular occupancy type (group) can be achieved by limiting the height and area of buildings containing such occupancies according to the building's construction type (i.e., its relative fire endurance).

The concept of equivalent risk involves three interdependent considerations: (1) the level of fire hazard associated with the specific occupancy of the facility; (2) the reduction of fire hazard by limiting the floor area(s) and the height of the building based on the fuel load (combustible contents and burnable building components) and (3) the level of overall fire resistance provided by the type of construction used for the building.

The interdependence of these fire safety considerations can be seen by first looking at Tables 601 and 602, which show the fire-resistance ratings of the principal structural elements comprising a building in relation to the five classifications for types of construction. Type I construction is the classification that generally requires the highest fire-resistance ratings for structural ele-

ments, whereas Type V construction, which is designated as a combustible type of construction, generally requires the least amount of fire-resistance-rated structural elements. If one then looks at Table 503, the relationship among group classification, allowable heights and areas and types of construction becomes apparent. Respective to each group classification, the greater the fire-resistance rating of structural elements, as represented by the type of construction, the greater the floor area and height allowances. The greater the potential fire hazards indicated as a function of the group, the lesser the height and area allowances for a particular construction type.

As a result of extensive research and advancements in fire technology, today's building codes are more comprehensive and complex regulatory instruments than they were in the earlier years of code development. While the principle of equivalent risk remains an important component in building codes, perspectives have changed and life safety is now the paramount fire issue. Even so, occupancy classification still plays a key part in organizing and prescribing the appropriate protection measures. As such, threshold requirements for fire protection and means of egress systems are based on occupancy classification (see Chapters 9 and 10).

Other sections of the code also contain requirements respective to the classification of building groups. For example, Section 102.6 deals with applicability of the code to existing structures, Section 704 deals with requirements for exterior wall fire-resistance ratings that are tied to the occupancy classification of a building and Section 803.5 contains interior finish requirements that are dependent upon the occupancy classification.

## Purpose

The purpose of this chapter is to classify a building, structure or part thereof into a group based on the specific purpose for which it is designed or occupied. Throughout the code, group classifications are considered a fundamental principle in organizing and prescribing the appropriate features of construction and occupant safety requirements for buildings, especially general building limitations, means of egress, fire protection systems and interior finishes.



## SECTION 301 GENERAL

**301.1 Scope.** The provisions of this chapter shall control the classification of all buildings and structures as to use and occupancy.

❖ As used throughout the code, the classification of an occupancy into a group is established by the requirements of this chapter. The purpose of these provisions is to provide rational criteria for the classification of various occupancies into groups based on their relative fire hazard and life safety properties. This is necessary because the code utilizes group classification as a fundamental principle for differentiating requirements in other parts of the code related to fire and life safety protection.

## SECTION 302 CLASSIFICATION

**302.1 General.** Structures or portions of structures shall be classified with respect to occupancy in one or more of the groups listed below. A room or space that is intended to be occupied at different times for different purposes shall comply with all of the requirements that are applicable to each of the purposes for which the room or space will be occupied. Structures with multiple occupancies or uses shall comply with Section 508. Where a structure is proposed for a purpose that is not specifically provided for in this code, such structure shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard involved.

1. Assembly (see Section 303): Groups A-1, A-2, A-3, A-4 and A-5
  2. Business (see Section 304): Group B
  3. Educational (see Section 305): Group E
  4. Factory and Industrial (see Section 306): Groups F-1 and F-2
  5. High Hazard (see Section 307): Groups H-1, H-2, H-3, H-4 and H-5
  6. Institutional (see Section 308): Groups I-1, I-2, I-3 and I-4
  7. Mercantile (see Section 309): Group M
  8. Residential (see Section 310): Groups R-1, R-2, R-3 and R-4
  9. Storage (see Section 311): Groups S-1 and S-2
  10. Utility and Miscellaneous (see Section 312): Group U
- ❖ This section requires all structures to be classified in one or more of the groups listed according to the structure's purpose and function (i.e., its occupancy). By organizing occupancies with similar fire hazard and life safety properties into groups, the code has adopted the means to differentiate occupancies such that various fire protection and life safety requirements can be rationally organized and applied. Each specific group has an individual classification. Each represents a dif-

ferent characteristic and level of fire hazard that requires special code provisions to lessen the associated risks. There are some group classifications that are very closely related to other specific groups and, therefore, are collectively referred to as a single group (e.g., Group F applies to Groups F-1 and F-2). In these cases, there are requirements within the code that are common to each specific group classification. These common requirements are applicable based on the reference to the collective classification. For example, the requirements of Section 1025 apply to each specific group classification listed under the term "Group A."

**Example 1:** Both a restaurant (Group A-2) and a church (Group A-3) are included in Group A, but they have different specific group classifications. Both Groups A-2 and A-3 are subject to the same travel distance limitations (see Table 1016.1) and corridor fire-resistance ratings (see Table 1017.1), although automatic sprinkler systems (see Section 903) are different.

Buildings that contain occupancies classified for more than one use are mixed occupancy buildings. Buildings with mixed occupancies must comply with one of the design options contained in Section 508.3. Accessory occupancies, incidental uses or any combination of these areas are not considered as mixed occupancies. This condition is permitted because such areas either do not represent a significant change in the performance characteristics of the structure or are otherwise appropriately protected by the provisions contained in this section. Where the provisions of this section are exceeded or otherwise not complied with, the occupancy is designated a mixed occupancy building and must comply with Section 508.3.

Occasionally, a building or space is intended to be occupied for completely different purposes at different times. For instance, a church hall might be used as a day care center during weekdays and as a reception hall for weddings and other similar events at other times. In these cases, the code provisions for each occupancy must be satisfied.

In cases where a structure has a purpose that is not specifically identified within any particular occupancy classification, that structure is to be classified in the group that it most closely resembles. Before an accurate classification can be made, however, a detailed description of the activities or processes taking place inside the building, the occupant load and the materials and equipment used and stored therein must be submitted to the building official. The building official must then compare this information to the various occupancy classifications, determine which one the building most closely resembles and classify the building as such.

**Example 2:** A designer presents the building official with a building occupancy needing a group classification. The building official is informed that the building

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is to be used as an indoor shooting gallery, open to the public but used mostly by police officers. After reviewing the code, he or she cannot find a specific reference to a shooting gallery in Sections 303 through 312 or in the associated tables. The building official asks the designer for additional information about the activities to be conducted in the building and is told that there will be a small sign-in booth, patron waiting/viewing area and the actual shooting area. Based on this information, the building official can determine that the most logical classification of the building is Group A-3, assembly. This classification is based on the fact that the building is used for the congregation of people for recreation. A shooting gallery is similar in many respects to a bowling center, which is classified as Group A-3 (see Figure 302.1).

**SECTION 303  
ASSEMBLY GROUP A**

**303.1 Assembly Group A.** Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption; or awaiting transportation.

**Exceptions:**

1. A building or tenant space used for assembly purposes with an occupant load of less than 50 persons shall be classified as a Group B occupancy.
2. A room or space used for assembly purposes with an occupant load of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
3. A room or space used for assembly purposes that is less than 750 square feet (70 m<sup>2</sup>) in area and is acces-

sory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

Assembly occupancies shall include the following:

**A-1** Assembly uses, usually with fixed seating, intended for the production and viewing of the performing arts or motion pictures including, but not limited to:

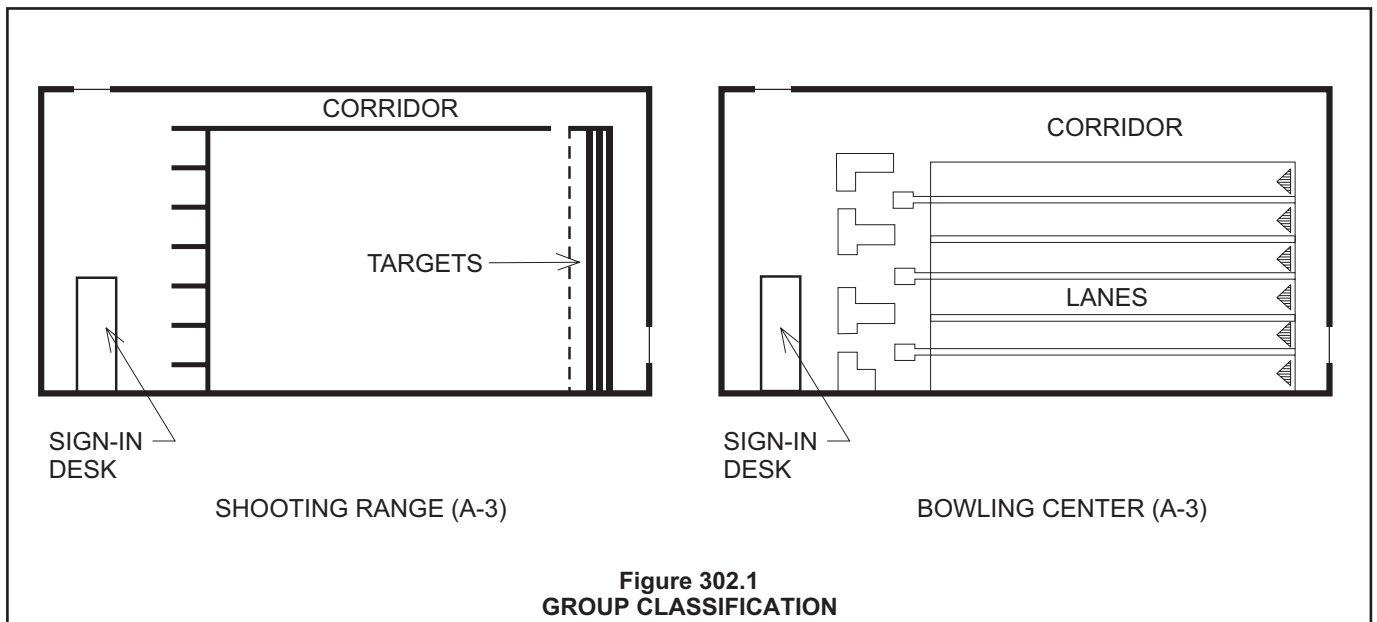
- Motion picture theaters
- Symphony and concert halls
- Television and radio studios admitting an audience
- Theaters

**A-2** Assembly uses intended for food and/or drink consumption including, but not limited to:

- Banquet halls
- Night clubs
- Restaurants
- Taverns and bars

**A-3** Assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including, but not limited to:

- Amusement arcades
- Art galleries
- Bowling alleys
- Places of religious worship
- Community halls
- Courtrooms
- Dance halls (not including food or drink consumption)
- Exhibition halls
- Funeral parlors
- Gymnasiums (without spectator seating)
- Indoor swimming pools (without spectator seating)
- Indoor tennis courts (without spectator seating)
- Lecture halls
- Libraries
- Museums



Waiting areas in transportation terminals  
Pool and billiard parlors

**A-4** Assembly uses intended for viewing of indoor sporting events and activities with spectator seating including, but not limited to:

Arenas  
Skating rinks  
Swimming pools  
Tennis courts

**A-5** Assembly uses intended for participation in or viewing outdoor activities including, but not limited to:

Amusement park structures  
Bleachers  
Grandstands  
Stadiums

❖ Because of the arrangement and density of the occupant load associated with occupancies classified in the assembly group category, the potential for multiple fatalities and injuries from fire is comparatively high. For example, no other use listed in Section 302.1 contemplates occupant loads as dense as 5 square feet (0.46 m<sup>2</sup>) per person (see Table 1004.1.1). Darkened spaces in theaters, nightclubs and the like serve to increase hazards. In sudden emergencies, the congestion caused by large numbers of people rushing to exits can cause panic conditions. For these and many other reasons, there is a relatively high degree of hazard to life safety in assembly facilities. The relative hazards of assembly occupancies are reflected in the height and area limitations of Table 503 that are, in comparison, generally more restrictive than for buildings in other group classifications.

There are five specific assembly group classifications, Groups A-1 through A-5, described in this section. Where used in the code, the general term "Group A" is intended to include all five classifications.

The fundamental characteristics of all assembly occupancies are identified in this section. Structures that are designed or occupied for assembly purposes must be classified in one of the assembly group classifications. Exceptions to this rule are accessory occupancies (see Section 508.3.1), small assembly buildings and assembly rooms or spaces in nonassembly buildings.

Exception 1 recognizes that there are often small establishments that typically serve food and have a few seats that technically meet the definition of an assembly occupancy but pose a lower risk than a typical assembly occupancy. These types of buildings are to be considered a Group O occupancy when they serve less than 50 people. Examples of this include small "fast food" establishments and small "mom-and-pop" restaurants or coffee shops. While not specifically addressed, this exception would also permit a tenant space in a building to be classified as Group B. For example, a tenant space within a strip mall.

Exceptions 2 and 3 address assembly rooms or spaces in nonassembly buildings. Exception 2 evaluates the occupant load (less than 50) of the assembly space, while Exception 3 evaluates the area [(less than 750 square feet (65 m<sup>2</sup>))] of the assembly space. In both cases, the purpose of the assembly space must be accessory to the principal occupancy of the structure (i.e., the activities in the assembly space are subordinate and secondary to the primary occupancy). If either the occupant load or floor area requirement is satisfied and the purpose of the assembly space is accessory to the principal occupancy, the space shall either be classified as a Group B occupancy or as part of the principal occupancy. In either case, the assembly space is not required to be less than 10 percent of the area of the story on which it is located. Note that the area stated in Exception 3 can be determined by taking the 50 occupants specified in Exception 2 and multiplying by the unconcentrated rate for assembly spaces of 15 square feet/person (1.4 m<sup>2</sup>) (see Table 1004.1.1).

The special exception given to assembly spaces in nonassembly buildings is a practical code consideration that permits a mixed occupancy condition to exist without requiring compliance with the provisions for mixed occupancies (see Section 508.3) or accessory occupancies (see Section 508.3.1). All other code requirements applicable to assembly occupancies, however, still apply to the assembly area (e.g., the design occupant load, means of egress design ventilation, floor live loads). This is because these requirements are most appropriately based on the occupancy of the space and not on the occupancy classification of the building.

**Example 1:** An office building, Group B, has a conference room used for staff meetings [see Figure 303.1(1)]. The occupancy of a conference room is classified as Group A-3. Since the occupant load of the conference room is less than 50 and its function is clearly accessory to the business area, the provisions of Exception 2 permit the room to be included in the main occupancy, Group B.

If the assembly area described in the example above was a game room, it would not qualify for the exception permitting the space to be considered as part of the Group B occupancy because the purpose of a game room is not functionally related to the business occupancy [see Figure 303.1(2)]. In such a case, the game room must be classified as a Group A-3 occupancy and the building evaluated as a mixed occupancy.

**Example 2:** A 749-square-foot (70 m<sup>2</sup>) assembly area is located on a mercantile floor area of 5,000 square feet (465 m<sup>2</sup>) [see Figure 303.1(3)]. While the assembly use area occupies 15 percent of the 5,000 square foot (465 m<sup>2</sup>) floor area, it does not exceed 750 square feet (70 m<sup>2</sup>) and is not considered a separate occupancy.

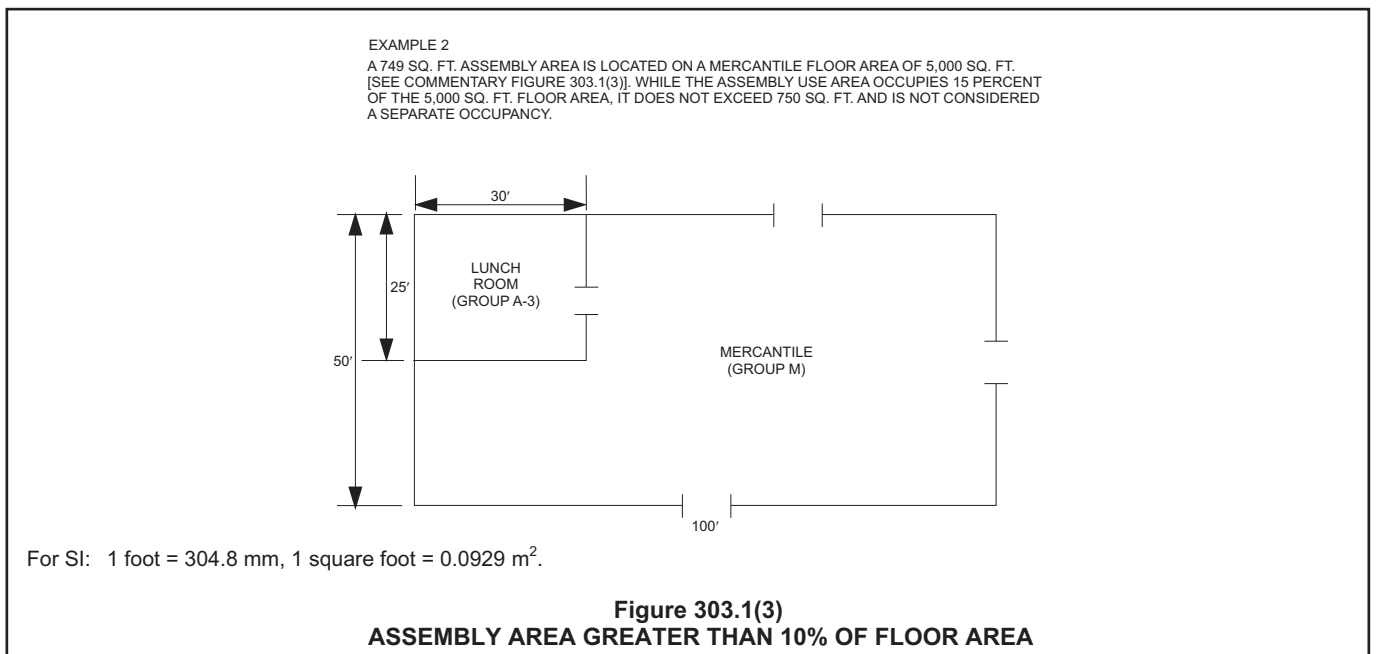
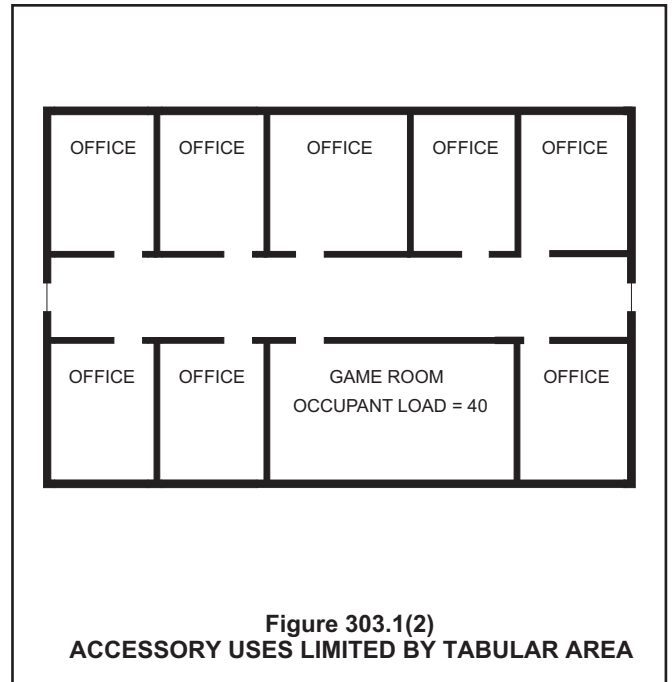
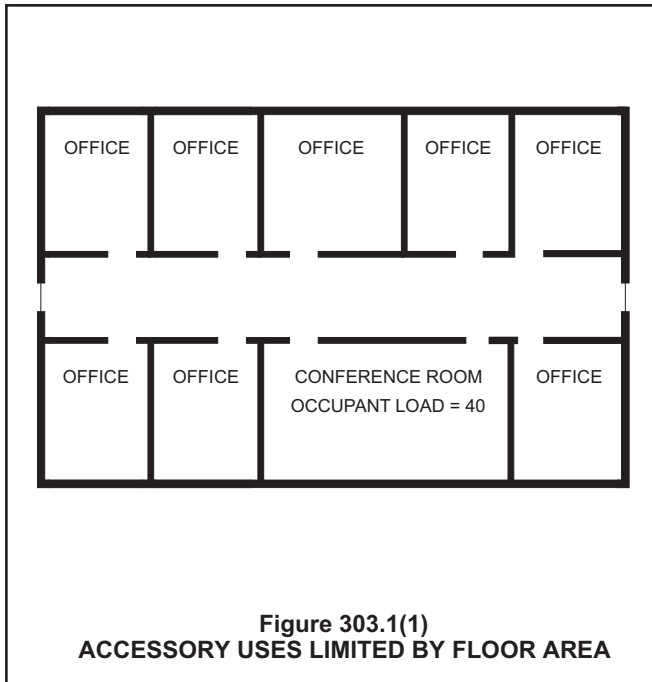
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Note that the location of the assembly spaces for use with Exceptions 2 and 3 must be taken into consideration. For example, if multiple assembly spaces, each 749 square feet (70 m<sup>2</sup>) in area, are located adjacent to each other or are closely spaced together, the aggregate area of the rooms should be considered rather than the individual areas. In that case, if the area is greater than 10 percent of the tenant or floor area, these spaces must be regulated as Group A-3. However, if various assembly spaces, each 749 square feet (70 m<sup>2</sup>) in area, are dispersed throughout the tenant or floor area, then these spaces would still be permitted to be classified as part of the main occu-

pancy. Other issues that need to be taken into consideration involve the function or utilization of these spaces (i.e., small conference rooms used for a few employees versus large boardrooms). Each situation must be evaluated on a case-by-case basis in order to determine whether the assembly spaces can be considered as part of the main occupancy.

**A-1:** Some of the characteristics of Group A-1 occupancies are large, concentrated occupant loads, low lighting levels, above-normal sound levels and a moderate fuel load.

Group A-1 is characterized by two basic types of ac-



For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m<sup>2</sup>.



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activities. The first type is one in which the facility is occupied for the production and viewing of theatrical or operatic performances. Facilities of this type ordinarily have fixed seating; a permanent raised stage; a proscenium wall and curtain; fixed or portable scenery drops; lighting devices; dressing rooms; mechanical appliances or other theatrical accessories and equipment [see Figure 303.1(4)].

The second type is one in which the structure is primarily occupied for the viewing of motion pictures. Facilities of this type ordinarily have fixed seating, no stage, a viewing screen, motion picture projection booth(s) and equipment [see Figure 303.1(5)].

Group A-1 presents a significant potential life safety hazard because of the large occupant loads and the concentration of people within confined spaces. The means of egress is an important factor in the design of such facilities. Theaters for the performing arts that require stages are considered particularly hazardous because of the amount of combustibles such as curtains, drops, scenery, construction materials and other accessories normally associated with stage operation. As such, special protection requirements applicable to stages and platforms are provided in Section 410.

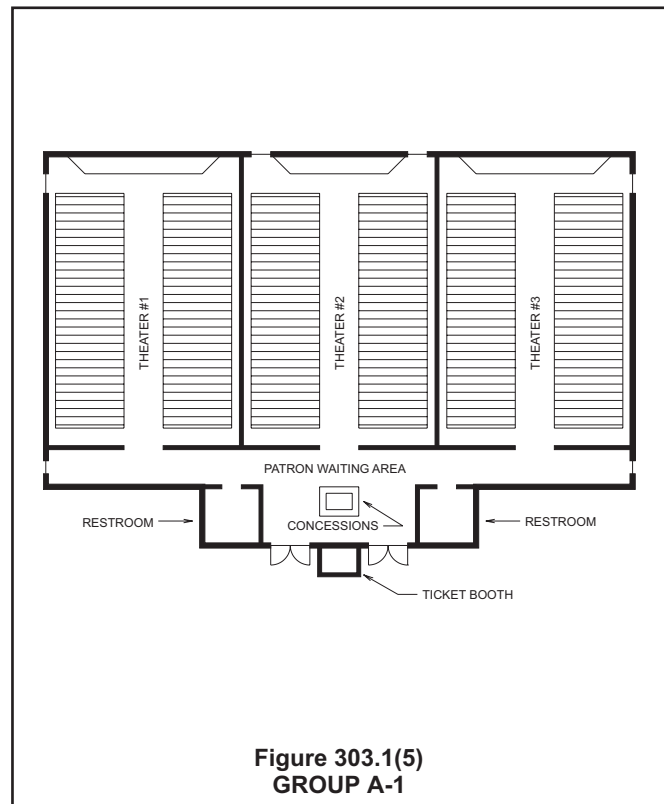
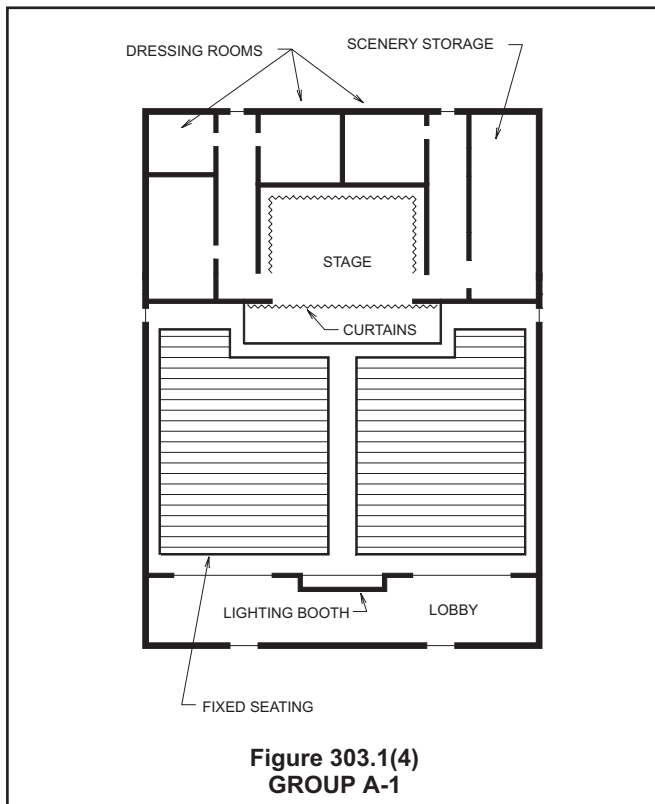
**A-2:** Group A-2 includes occupancies in which people congregate in high densities for social entertainment, such as drinking and dancing (e.g., nightclubs, dance halls, banquet halls, cabarets, etc.) and food and drink consumption (e.g., restaurants). The uniqueness of

these occupancies is characterized by some or all of the following:

- Low lighting levels;
- Entertainment by a live band or recorded music generating above-normal sound levels;
- No theatrical stage accessories;
- Later-than-average operating hours;
- Tables and seating arranged or positioned so as to create ill-defined aisles;
- A specific area designated for dancing;
- Service facilities for alcoholic beverages and food; and
- High occupant load density.

The fire records are very clear in identifying that the characteristics listed above often cause a delayed awareness of a fire situation and confuse the appropriate response, resulting in an increased egress time and sometimes panic. Together, these factors may result in extensive life and property losses. These characteristics are only advisory in determining whether Group A-2 is the appropriate classification. Often there are additional characteristics that are unique to a project, which also must be taken into consideration when a classification is made.

**Example:** The Downtown Club, a popular local nightclub/dance hall, features a different band every weekend [see Figure 303.1(6)]. It is equipped with a bar and basic kitchen facilities so that beverages and appetizers can be served. There is a platform for a band



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to perform, a dance floor in front of the platform and numerous cocktail tables and chairs. The tables and chairs are not fixed, resulting in a hazardous arrangement because there are no distinct aisles. When the band performs, the house lights are dimmed and spotlights are keyed in on the performers. The club is equipped with a sound system that is used at loud levels. The club is open until 3:00 a.m.—the latest time the local jurisdiction will allow.

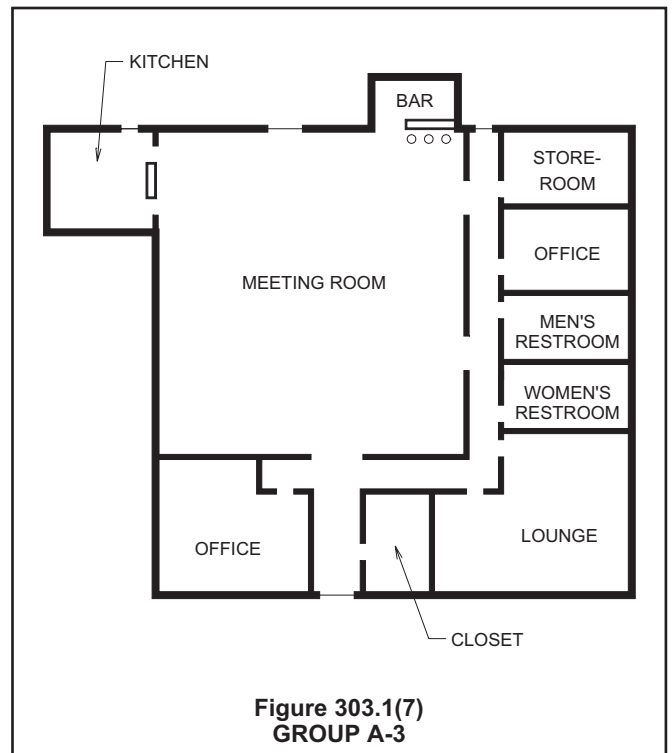
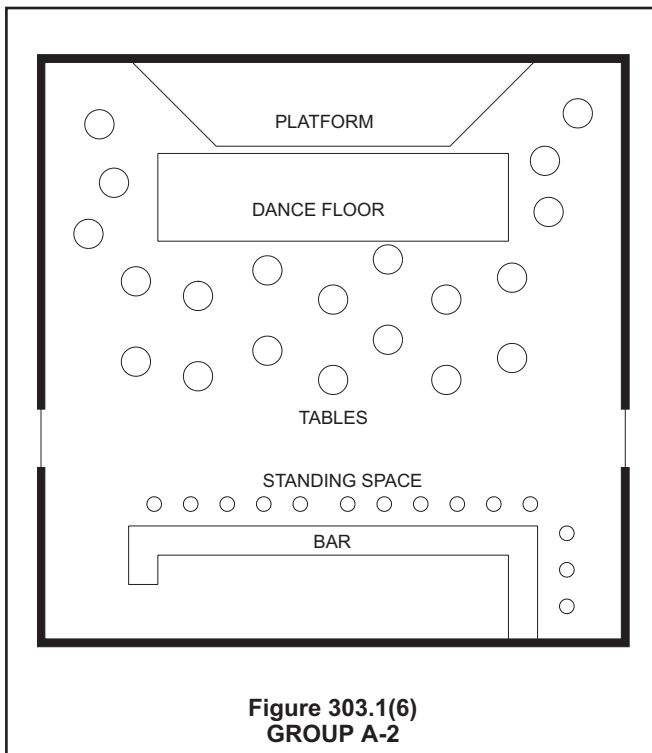
From this description of the Downtown Club, one can readily see that the appropriate classification is Group A-2. Sometimes, however, it is not this easy to determine the appropriate classification. In such cases, the building official must seek additional information regarding the function(s) of the building and each area within the building.

**A-3:** Structures in which people assemble for the purpose of social activities (such as entertainment, recreation and amusement) that are neither classified in Group A-1 or A-2 nor appropriately classified in Group A-4 or A-5 are to be classified in Group A-3. Exhibition halls, libraries, museums, gymnasiums, recreation centers, health clubs, fellowship halls, indoor shooting galleries, bowling centers, billiard halls and the like are among the facilities often classified in Group A-3. Also, since they most nearly resemble this occupancy classification, public and private spaces used for assembly are often classified in Group A-3. These include large courtrooms, meeting rooms and conference centers. Similarly, lecture rooms located in colleges, universities or in schools for students above the 12th grade that have an occupant load of 50 or more, are also classified in Group A-3. [Note that as-

sembly areas that are accessory to Group E occupancies are not required to be regulated as separate occupancies (see Section 508.3.1, Exception 2)]. Structures in which people gather exclusively for worship and other religious purposes are also classified as Group A-3. Although such worship and religious purposes are without restriction to any particular sect or creed, the intent of the code is to limit Group A-3 classification to occupancies that are specifically related to worship services, devotions and religious rituals.

Religious facilities differ from other assembly occupancies in that the activity is, by nature, more orderly and their use tends to be most often limited in duration and frequency. Furthermore, the occupants of such facilities usually are very familiar with the facility and are well oriented to its egress pattern. Religious buildings typically contain a vestibule (narthex), a seating area (nave), an altar area (sanctuary) and a chancel (the area around and including the altar, including areas for clergy and choir). This is illustrated in Figure 303.1(7).

Frequently, other occupancies are located within the same structure where religious services (Group A-3) are performed [e.g., classrooms (Group E), care for infants (Group I-4) and staff offices (Group B)]. When this occurs, and depending on their size, these occupancies must be considered as either accessory occupancies or other principal occupancies. As indicated in Section 508.3.1, Exception 3, religious educational classrooms with occupant loads less than 100 would be permitted to be classified as part of the Group A-3 occupancy. Any area that does not qualify as an accessory occupancy (see Section 508.3.1)



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must be classified in another occupancy. Accordingly, the structure then contains multiple occupancies and is subject to the provisions of Section 508.3. Similar to accessory assembly spaces, the intent of the occupant load threshold for religious educational rooms and religious auditoriums is not to create several rooms closely spaced together, each with an occupant load of less than 100. In this case, those rooms would be classified as Group E. Note that for height and area purposes, whether regulated as nonseparated mixed occupancies, a fire barrier or horizontal assembly is not required.

The fire hazard in terms of combustible contents (fuel load) in structures classified in Group A-3 is most often expected to be moderate to low. Since structures classified in Group A-3 vary widely as to the purpose for which they are used, the range of fuel load varies widely. For example, the fuel load in a library or an exhibition hall usually is considerably greater than that normally found in a gymnasium.

**A-4:** Structures provided with spectator seating in which people assemble to watch an indoor sporting event are to be classified as Group A-4. Arenas, skating rinks, swimming pools and tennis courts are among the facilities often classified as Group A-4. The distinguishing factor between Group A-4 and A-5 structures is whether the event is indoors or outdoors. Group A-4 facilities are limited to indoor structures only. The distinguishing factor between Group A-4 and Group A-3 facilities is the presence of a defined seating area. While Group A-3 facilities are indoors (i.e., tennis courts, swimming pools.), they typically do not have a defined seating area in which to view the event. Only facilities that are both indoors and have a defined seating area are to be classified as Group A-4.

**A-5:** Structures classified in Group A-5 are outdoor facilities where people assemble to view or participate in social and recreational activities (e.g., stadiums, grandstands, bleachers, coliseums). In order to qualify as an outdoor facility, the structure must be one where the products of combustion are freely and rapidly vented to the atmosphere (i.e., a structure without enclosures that would prevent the free movement of smoke from the occupied area to the outside). Any recreation facility that has exterior walls that enclose the facility and a roof that fully covers the area would not be classified in Group A-5, but rather in Group A-3 or A-4 depending on whether a seating area has been provided. In the case of a structure with a retractable roof, the more stringent occupancy classification (i.e., Group A-4) would be required.

Since occupancies classified in Group A-5 are primarily viewing and sports participation areas, the fuel load associated with them is very low (i.e., the structure itself and seats). Since the fuel load present is relatively low and the expectation is that smoke will be quickly evacuated from the structure, the relative fire hazard of occupancies classified in Group A-5 is ex-

pected to be low. The life safety hazard from panic that might occur in an emergency, however, is a serious concern; hence, the capability of large crowds to exit the structure quickly and orderly during emergencies is an important design consideration (see Section 1025).

## SECTION 304 BUSINESS GROUP B

**304.1 Business Group B.** Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

- Airport traffic control towers
- Animal hospitals, kennels and pounds
- Banks
- Barber and beauty shops
- Car wash
- Civic administration
- Clinic—outpatient
- Dry cleaning and laundries: pick-up and delivery stations and self-service
- Educational occupancies for students above the 12th grade
- Electronic data processing
- Laboratories: testing and research
- Motor vehicle showrooms
- Post offices
- Print shops
- Professional services (architects, attorneys, dentists, physicians, engineers, etc.)
- Radio and television stations
- Telephone exchanges
- Training and skill development not within a school or academic program

❖ The risks to life safety in the business occupancy classification are relatively low. Exposure to the potential effects of fire is limited because business-type facilities most often have low fuel loads, are normally occupied only during the daytime and, with some exceptions, are usually occupied for a set number of hours. The occupants, because of the nature of the use, are alert, ambulatory, conscious, aware of their surroundings and generally familiar with the building's features, particularly the means of egress. Historically, this occupancy has one of the better fire safety records for the protection of life and property.

This section identifies the general characteristics and lists examples of occupancies that are classified in Group B. Note that the description recognizes the need for limited storage spaces that are incidental to office occupancies. Classrooms and laboratories that are located in colleges, universities and academies for educating students above the 12th grade and that have an occupant load of less than 50 are classified in Group B. Classrooms with an occupant load of 50 or more are classified in Group A-3 (see Section 303.1).

Classrooms for children through the 12th grade with

an occupant load of less than 50 are classified in Group E (see Section 305.1). When lecture facilities for large groups (i.e., occupant load of 50 or more) are located within the same building where classrooms with an occupant load less than 50 are found, the building is a mixed occupancy (Groups A-3 and B) and is subject to the provisions of Section 508.3.

Outpatient clinics generally consist of a group of doctor's offices where various medical services can be provided. These clinics are assumed to function during normal business hours (i.e., less than 24 hours) and the patients are generally ambulatory and capable of self-preservation. Admittedly, some patients may be "temporarily" incapacitated due to anesthesia or recovery purposes; however, a building that is used for elective, cosmetic or nonlife-saving surgeries would be classified as Group B. The Group B occupancy classification does not assume surgical procedures with extensive in-house recovery times, potential complex medical/surgical procedures or overnight stays. Buildings used for trauma centers, urgent care or emergency room services would more appropriately be classified as Group I-2. Buildings used as sleep clinics would also be classified as Group B since these spaces are not typical dwelling or sleeping units where people live, the occupants are assumed to be capable of self-preservation and the occupants are not living in a supervised environment.

## SECTION 305 EDUCATIONAL GROUP E

**305.1 Educational Group E.** Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade. Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with Section 508.3.1 and have occupant loads of less than 100, shall be classified as A-3 occupancies.

❖ The risks to life safety in this occupancy vary with the composition of the facilities and also with the ages of the occupants. In general, children require more safeguards than do older, more mature persons.

This section identifies the criteria for classification of a building in Group E. The two fundamental characteristics of a Group E facility are as follows:

1. The facility is occupied by more than five persons (including the instructor); and
2. The purpose of the facility is for educating persons at the 12th-grade level and below, but not including more than five occupants 2<sup>1</sup>/<sub>2</sub> years of age or less.

Occupancies used for the education of persons above the 12th-grade level are not included in Group E. These facilities are occupied by adults who are not expected to require special supervision, direction or

instruction in a fire or other emergency. By the same measure, however, they also are not closely supervised; therefore, classrooms and laboratories located in colleges, universities and academies for students above the 12th grade are classified in Group B, because the occupancy characteristics and potential hazards to life safety present in these facilities more nearly resemble those of a business occupancy than educational occupancy. Similarly, lecture halls for students above the 12th grade with an occupant load of 50 or more are classified in Group A-3 (see Section 303.1).

It is common for a school to also have gymnasiums (Group A-3), auditoriums (Group A-1), libraries (Group A-3), offices (Group B) and storage rooms (Group S-1). When this occurs, the building is a mixed occupancy and is subject to the provisions of Section 508.3. In accordance with Section 508.3.1, Exception 2, assembly spaces, such as the gymnasium, auditorium, library and cafeteria, do not have to be considered separate occupancies if used for school purposes only and is limited to school occupants (see commentary, Section 508.3.1).

Places of religious worship, religious educational rooms and religious auditoriums are often provided in the same building complex. These religious and educational rooms and religious auditoriums are not to be considered separate occupancies (i.e., Group E) as long as the occupant load in these spaces is no greater than 99 people. Similar to accessory assembly spaces, the intent of the occupant load threshold for religious educational rooms and religious auditoriums is not to create several rooms closely spaced together, each with an occupant load of less than 100. In this case, these rooms would be classified as Group E and the building would be considered a mixed occupancy and subject to the provisions of Section 508.3.

**305.2 Day care.** The use of a building or structure, or portion thereof, for educational, supervision or personal care services for more than five children older than 2<sup>1</sup>/<sub>2</sub> years of age, shall be classified as a Group E occupancy.

❖ Day care centers are a special problem since they are generally occupied by preschool children who are less capable of responding to an emergency. The hazards found in a day care center are far greater than in normal educational facilities, not so much because of the occupant or fuel load, but because of the inability of the occupants to respond.

Day care occupancies include facilities intended to be used for the care and supervision of more than five children for a period of less than 24 hours per day and that do not contain at any time more than five children who are 2<sup>1</sup>/<sub>2</sub> years of age or less. Facilities that provide care for more than five occupants greater than the 12th grade are to be classified as adult care facilities (Group I-4, Section 308.5.1) or Group A-3.

Children 2<sup>1</sup>/<sub>2</sub> years of age or less usually are not able to recognize an emergency situation, may not re-



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spend appropriately or simply may not be able to egress without assistance; thus, facilities that have more than five children 2½ years of age or less are classified as child care facilities and considered to be Group I-4 (see Section 308.5.2). Figure 308.3.1 summarizes the appropriate occupancy classifications for day care, adult care (more than five adults, less than 24 hours) and child care facilities.

## SECTION 306 FACTORY GROUP F

**306.1 Factory Industrial Group F.** Factory Industrial Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H hazardous or Group S storage occupancy.

❖ The purpose of this section is to identify the characteristics of occupancies that are classified in factory and industrial occupancies and to differentiate Groups F-1 and F-2.

Because of the vast number of diverse manufacturing and processing operations in the industrial community, it is more practical to classify such facilities by their level of hazard rather than their function. In industrial facilities, experience has shown that the loss of life or property is most directly related to fire hazards, particularly the fuel load contributed by the materials being fabricated, assembled or processed.

Statistics show that property losses are comparatively high in factory and industrial occupancies, but the record of fatalities and injuries from fire has been remarkably low. This excellent life safety record can, in part, be attributed to fire protection requirements of the code.

This section requires that all structures that are used for fabricating, finishing, manufacturing, packaging, assembling or processing products or materials are to be classified in either Group F-1 (moderate hazard) or F-2 (low hazard). These classifications are based on the relative level of hazard for the types of materials that are fabricated, assembled or processed. Where the products and materials in a factory present an extreme fire, explosion or health hazard, such facilities are classified in Group H (see Section 307). It should be noted that the term "Group F" is not a specific occupancy, but is a term that collectively applies to Groups F-1 and F-2.

**306.2 Factory Industrial F-1 Moderate-hazard Occupancy.** Factory industrial uses which are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

- Aircraft
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles

- Bakeries
- Beverages; over 12-percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment
- Canvas or similar fabric
- Carpets and rugs (includes cleaning)
- Clothing
- Construction and agricultural machinery
- Disinfectants
- Dry cleaning and dyeing
- Electric generation plants
- Electronics
- Engines (including rebuilding)
- Food processing
- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Machinery
- Metals
- Millwork (sash & door)
- Motion pictures and television filming (without spectators)
- Musical instruments
- Optical goods
- Paper mills or products
- Photographic film
- Plastic products
- Printing or publishing
- Recreational vehicles
- Refuse incineration
- Shoes
- Soaps and detergents
- Textiles
- Tobacco
- Trailers
- Upholstering
- Wood; distillation
- Woodworking (cabinet)

❖ Structures classified in Group F-1 (moderate hazard) are occupied for the purpose of fabrication, finishing, manufacturing, packaging, assembly or processing of materials that are combustible or that use combustible products in the production process.

**306.3 Factory Industrial F-2 Low-hazard Occupancy.** Factory industrial uses that involve the fabrication or manufacturing of noncombustible materials which during finishing, packing or processing do not involve a significant fire hazard shall be classified as F-2 occupancies and shall include, but not be limited to, the following:

- Beverages; up to and including 12-percent alcohol content
- Brick and masonry
- Ceramic products
- Foundries

Glass products  
Gypsum  
Ice  
Metal products (fabrication and assembly)

- ❖ Structures classified in Group F-2 (low hazard) are occupied for the purpose of fabrication, manufacturing or processing of noncombustible materials. It is acceptable for noncombustible products to be packaged in a combustible material, provided that the fuel load contributed by the packaging is negligible when compared to the amount of noncombustible product. The use of a significant amount of combustible material to package or finish a noncombustible product, however, will result in a Group F-1 (moderate-hazard factory and industrial) classification.

To distinguish when the presence of combustible packaging constitutes a significant fuel load, possibly requiring the reclassification of the building or structure as Group F-1, a reasonable guideline to follow is the "single thickness" rule, which is when a noncombustible product is put in one layer of packaging material.

Examples of acceptable conditions in Group F-2 are:

- Vehicle engines placed on wood pallets for transportation after assembly;
- Washing machines in corrugated cardboard boxes; and
- Soft-drink glass bottles packaged in pressed paper boxes.

Occupancies involving noncombustible items packaged in more than one layer of combustible packaging material are most appropriately classified in Group F-1.

Typical examples of packaging that would result in a Group F-1 classification are:

- Chinaware wrapped in corrugated paper and placed in cardboard boxes;
- Glassware set in expanded foam forms and placed in cardboard boxes; and
- Fuel filters individually packed in pressed paper boxes, placed by the gross in a cardboard box and stacked on a pallet for transportation.

Factories and industrial facilities often have offices and areas where large quantities of materials are kept in the same building as manufacturing operations, fabrication processes and assembly processes. The stock areas that are not regulated as incidental use areas (see Section 508.2) are classified as either Group S-1 or S-2, depending on the combustibility of the materials stored. Areas used for offices that do not qualify as accessory occupancies (see Section 508.3.1) are classified in Group B. When these combinations of occupancies occur, as well as other combinations of occupancies, the building is subject to the mixed occupancy provisions in Section 508.3.

## SECTION 307 HIGH-HAZARD GROUP H

**[F] 307.1 High-hazard Group H.** High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in control areas constructed and located as required in Section 414. Hazardous uses are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this section, the requirements of Section 415 and the *International Fire Code*.

**Exceptions:** The following shall not be classified in Group H, but shall be classified in the occupancy that they most nearly resemble:

1. Buildings and structures that contain not more than the maximum allowable quantities per control area of hazardous materials as shown in Tables 307.1(1) and 307.1(2), provided that such buildings are maintained in accordance with the *International Fire Code*.
2. Buildings utilizing control areas in accordance with Section 414.2 that contain not more than the maximum allowable quantities per control area of hazardous materials as shown in Tables 307.1(1) and 307.1(2).
3. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
4. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
5. Closed piping systems containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
6. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers or 1-hour horizontal assemblies or both.
7. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).
8. Liquor stores and distributors without bulk storage.
9. Refrigeration systems.
10. The storage or utilization of materials for agricultural purposes on the premises.
11. Stationary batteries utilized for facility emergency power, uninterrupted power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and ventilation is

provided in accordance with the *International Mechanical Code*.

12. Corrosives shall not include personal or household products in their original packaging used in retail display or commonly used building materials.
13. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
14. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with Section 414.2.5.
15. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.

❖ This section identifies the various types of facilities contained in the high-hazard occupancy. This occupancy classification relates to those facilities where the storage of materials or the operations are deemed to be extremely hazardous to life and property, especially when they involve the use of significant amounts of highly combustible, flammable or explosive materials, regardless of their composition (i.e., solids, liquids, gases or dust). Although they are not explosive or highly flammable, other hazardous materials, such as corrosive liquids, highly toxic materials and poisonous gases, still present an extreme hazard to life. Many materials possess multiple hazards, whether physical or health related.

There is a wide range of high-hazard operations in the industrial community; therefore, it is more practical to categorize such facilities in terms of the degree of hazard they present, rather than attempt to define a facility in terms of its function. This method is similar to that used to categorize factory (see Section 306) and storage (see Section 311) occupancies.

Group H is handled as a separate classification because it represents an unusually high degree of hazard that is not found in the other occupancies. It is important to isolate those industrial or storage operations that pose the greatest dangers to life and property and to reduce such hazards by providing systems or elements of protection through the regulatory provisions of building codes.

Operations that, because of the materials utilized or stored, cause a building or portion of a building to be classified as a high-hazard occupancy are identified in this section. While buildings classified as Group H may not have a large occupant load, the unstable chemical properties of the materials contained on the premises constitute an above-average fuel load and serve as a potential danger to the surrounding area.

The dangers created by the high-hazard materials

require special consideration for the abatement of the danger. The classification of a material as high hazard is based on information derived from National Fire Protection Association (NFPA) standards and the Code of Federal Regulations (DOL 29 CFR).

The wide range of materials utilized or stored in buildings creates an equally wide range of hazards to the occupants of the building, the building proper and the surrounding area. Since these hazards range from explosive to corrosive conditions, the high-hazard occupancy has been broken into four subclassifications: Groups H-1 through H-4. A fifth category, Group H-5, is used to represent structures that contain hazardous production material (HPM) facilities. Each of these subclassifications addresses materials that have similar characteristics and the protection requirements attempt to address the hazard involved. These subclassifications are defined by the properties of the materials involved with only occasional reference to specific materials. This performance-based criterion may involve additional research to identify a hazard, but it is the only way to remain current in a rapidly changing field. Material Safety Data Sheets (MSDS) will be a major source for information.

Additional information on hazardous materials can be found in Section 415 as well as the commentary to the *International Fire Code*® (IFC®).

The exceptions list conditions that are exempt from a high-hazard classification because of the building's construction or use; the packaging of materials, the quantity of materials or the precautions taken to prevent fire. Even if a high-hazard material meets one of the exceptions, its storage and use must comply with the applicable provisions of Section 414 and the IFC.

Exception 1 allows specific quantities of hazardous materials to be located in a building without it being classified as a high-hazard occupancy. These quantities have been determined to be relatively safe in amounts no greater than those prescribed in Tables 307.1(1) and 307.1(2) when maintained in accordance with the IFC.

Exception 2 provides an alternative use of control areas as indicated in Section 414.2 in order to exceed the maximum allowable quantity per control area of Tables 307.7(1) and 307.7(2) within a given building without classifying the building as a high-hazard occupancy. Maximum allowable quantities per control area are not specified with respect to the entire building area since this would, in effect, limit the quantities of hazardous materials within a building before being classified as Group H, regardless of building area, degree of fire separation or additional methods of mitigation (see commentary, Section 414.2).

Exception 3 exempts spray painting and similar operations within buildings from being classified as a high-hazard occupancy. This exception requires that all such operations, as well as the handling of flammable finishes, are in accordance with the provisions of Section 416 and the IFC; therefore, an adequately protected typical paint spray booth in a factory (Group

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F-1) would not result in a high-hazard occupancy classification for either the building or the paint spray area.

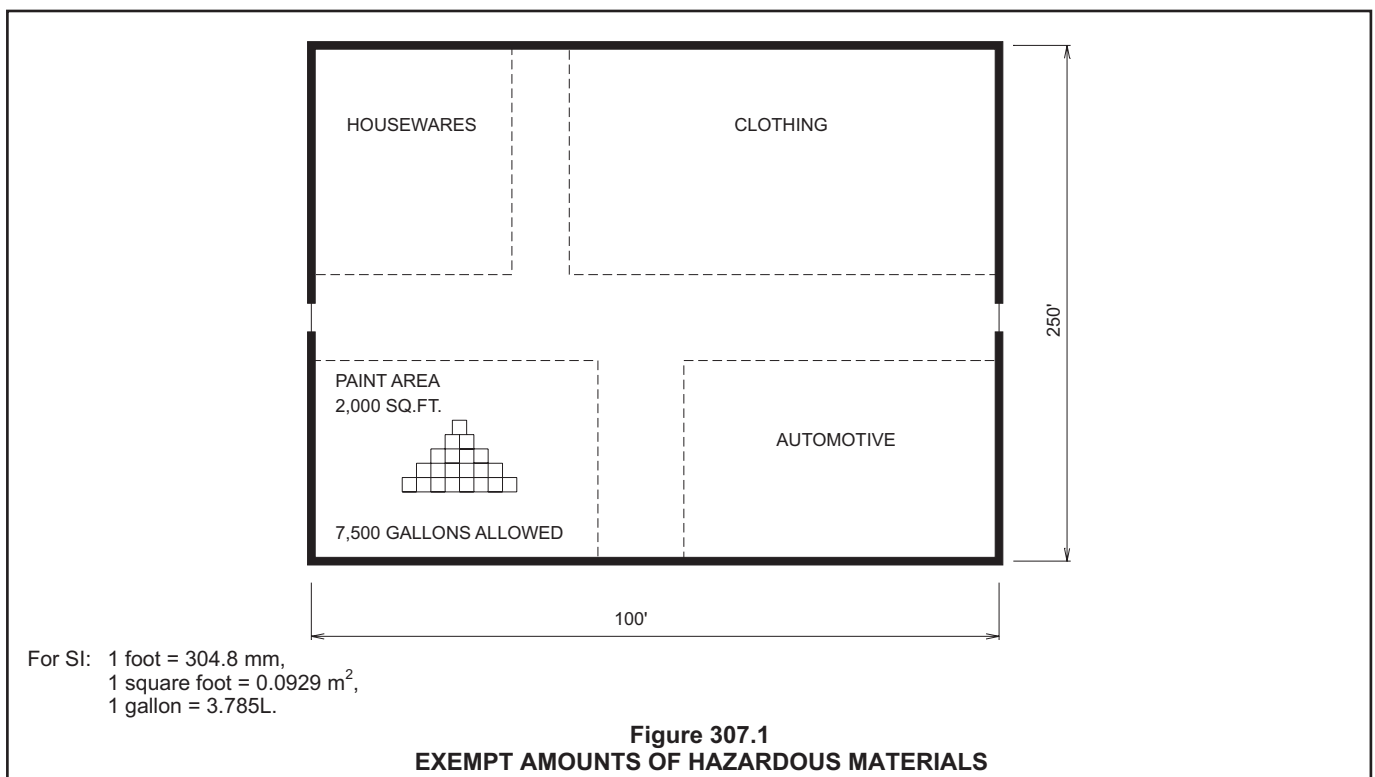
Exception 4 relies on the provisions of NFPA 30 and the IFC to regulate the storage of flammable and combustible liquids in wholesale and retail occupancies. The overall permitted amount of flammable and combustible liquids is dependent on the level of sprinkler protection provided in accordance with Section 4.5.6 of NFPA 30. For unsprinklered buildings, the publicly accessible display areas are limited to the aggregate quantity of Class IB, IC, II and IIIA liquids not to exceed 2 gallons per square foot ( $0.05 \text{ L/m}^2$ ) of gross floor area with a maximum total quantity of 7,500 gallons (28 388 L). Class IA liquids are limited to a total of 120 gallons (454 L). If the display areas were equipped with an NFPA 13 automatic sprinkler system with a minimum design density adequate for an Ordinary Hazard Group 2 occupancy, the density of the stored liquids could be increased to 4 gallons per square foot ( $0.1 \text{ L/m}^2$ ) of floor area. The aggregate total would still be limited to 7,500 gallons (28 388 L) of Class IB, IC, II and IIIA liquids with a maximum total of 120 gallons (454 L) of Class IA liquids. NFPA 30 would also permit the maximum total quantities listed above to be doubled when enhanced sprinkler protection based on substantiated fire test data is provided. The maximum quantity of liquid that can be stored is based on the floor area actually being used for display of the liquids plus the aisle spaces immediately adjacent thereto.

**Example:** A local department store has an open area of 25,000 square feet ( $2323 \text{ m}^2$ ) per floor (i.e., each floor is one room). The area assigned to flammable paint sales is 2,000 square feet ( $186 \text{ m}^2$ ). The

building, including the paint sales area, is protected by an Ordinary Hazard Group 2 sprinkler system. Based on this exception, the facility is permitted to store 7,500 gallons (28 388 L) of oil-based or other types of paint, classified as a high-hazard material, in the 2,000-square-foot ( $186 \text{ m}^2$ ) area devoted to retail paint sales. While a density of 4 gallons per square foot ( $0.1 \text{ L/m}^2$ ) of retail paint sales is permitted in sprinklered occupancies, the total permitted quantity is limited to 7,500 gallons (28 388 L), as illustrated in Figure 307.1. For calculation purposes, the floor area used to determine the maximum allowable quantity is the entire floor area [2,000 square feet ( $186 \text{ m}^2$ )] used for that purpose.

Exception 5 exempts closed systems that are used exclusively for the operation of machinery or equipment. The closed piping systems, which are essentially not open to the atmosphere, keep flammable or combustible liquids from direct exposure to external sources of ignition as well as prevent the users from coming in direct contact with liquids or harmful vapors. This exception would include systems such as oil-burning equipment, piping for diesel fuel generators and LP-gas cylinders for use in forklift trucks.

Exception 6 exempts cleaning establishments that utilize a closed system for all combustible liquid solvents with a flash point at or above  $140^\circ\text{F}$  ( $60^\circ\text{C}$ ). The reference to using equipment listed by an approved testing laboratory does not mean that the entire system needs to be approved, but rather the individual pieces of equipment. As with any mechanical equipment or appliance, it should bear the label of an approved agency and be installed in accordance with the





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manufacturer's installation instructions [see the *International Mechanical Code*® (IMC®)].

Exception 7 covers cleaning establishments that use solvents that have very high flash points [at least 200°F (93°C)] and that are exceedingly difficult to ignite. Such liquids can be used openly, but with due care.

Exception 8 exempts all retail liquor stores and liquor distribution facilities from the high-hazard occupancy classification, even though most of the contents are considered combustible liquids. The exception takes into account that alcoholic beverages are packaged in individual containers of limited size.

Exception 9 refers to refrigeration systems that utilize refrigerants that may be flammable or toxic. Refrigeration systems do not alter the occupancy classification of the building, provided they are installed in accordance with the IMC. The IMC has specific limitations on the quantity and type of refrigerants that can be used, depending on the occupancy classification of the building.

Exception 10 exempts materials that are used for agricultural purposes, such as fertilizers, pesticides, fungicides, etc., when used on the premises. Agricultural materials stored for direct or immediate use are not usually of such quantities that would constitute a large fuel load or an exceptionally hazardous condition.

Exception 11 addresses battery storage rooms when used as part of an operating system, such as for providing standby power. The batteries used in installations of this type do not represent a significant health, safety or fire hazard. The electrolyte and battery casing contribute little fuel load to a fire. The release of hydrogen gas during the operation of battery systems is minimal. Ventilation in accordance with the IMC will disperse the small amounts of liberated hydrogen.

Without Exception 12 certain products that technically are corrosive could cause grocery stores and other mercantile occupancies to be inappropriately classified as Group H-4. This exception allows the maximum allowable quantity per control area in Table 307.1(2) for corrosives to be exceeded in the retail display area. This would include such things as bleaches, detergents and other household cleaning supplies in normal-size containers. The exception also exempts the storage or manufacture of commonly used building materials, such as portland cement, from being inappropriately classified as Group H.

Exception 13 exempts buildings and structures used for the storage and manufacture of aerosol products, provided they are protected in accordance with the provisions of NFPA 30B and the IFC. The aerosol storage requirements in the IFC, referred to in this exception, are based on the provisions of NFPA 30B. Compliance with the exception exempts buildings from complying with the code provisions for Group H,

provided the storage and manufacturing of aerosol products comply with the applicable separation, storage limitations and sprinkler design requirements specified in the IFC and NFPA 30B.

Exception 14 permits certain products found in mercantile and storage occupancies, which may be comprised of hazardous materials, to exceed the maximum allowable quantity per control area of Tables 307.1(1) and 307.1(2). The products, however, must be comprised of nonflammable solids, liquids that are nonflammable or noncombustible or health hazard gases. Materials could include swimming pool chemicals, which are typically Class 2 or 3 oxidizers or industrial corrosive cleaning agents (see commentary, Section 414.2.5).

Exception 15 permits the base maximum allowable quantity per control area of black powder, smokeless propellant and small arms primers in Group M and R-3 occupancies to be exceeded, provided the material is stored in accordance with Chapter 33 of the IFC. The requirements are based on the provisions in NFPA 495.

Similarly, special industrial explosive devices are found in a number of occupancies other than Group H (Groups B, F, M and S). Storage of these devices in accordance with the IFC is not required to have a high-hazard occupancy classification. Power drivers are commonly used in the construction industry, and there are stocks of these materials maintained for sale and use by the trade. The automotive airbag industry has evolved with the use of these devices, and they are located in automotive dealerships and personal use vehicles throughout society. The IFC currently exempts up to 50 pounds (23 kg) of these materials from regulation under Chapter 33 (explosives).

**TABLE 307.1(1).** See page 3-17.

❖ The maximum allowable quantities of high-hazard materials allowed in each control area before having to classify a part of the (or the entire) building as a high-hazard occupancy are given in the table. This table is referenced in Exception 1 of Section 307.1. The materials listed in this table are classified according to their specific occupancy in Sections 307.3 through 307.5 and defined in Section 307.2. This table only contains materials applicable to Groups H-1, H-2 and H-3. The maximum allowable quantities per control area for Group H-4 materials are listed in Table 307.1(2).

The presence of any one or more of the materials listed in Table 307.1(1) in an amount greater than allowed requires that the building or area in which the material is contained be classified as a high-hazard occupancy.

If a building or area contains only the materials listed in either Table 307.1(1) or 307.1(2) in the maximum allowable quantity per control area or less, then that building or area would not be classified as a high-haz-

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ard occupancy. The possible increase in overall danger that might exist should this occur because of the storage and use of incompatible materials is an issue that the code does not specifically address. In such situations, the building official can seek the advice of chemical engineers, fire protection engineers, fire service personnel or other experts in the use of hazardous materials. Based on their advice, the building official can deem the building a high-hazard occupancy.

The maximum allowable quantity per control area listed in Table 307.1(1) is based on the concept of control areas as further regulated in Section 414. The quantities listed apply per control area. While every building area also represents a single control area, a given building may have multiple control areas, provided that the allowable amount within each control area is not exceeded and adequate fire-resistance-rated separation is provided between control areas. As indicated in Exception 2 of Section 307.1, a building that utilizes multiple control areas and complies with the applicable provisions of Section 414 is not classified as Group H. The number, degree of separation and location of control areas are indicated in Section 414.

Table 307.7(1) is subdivided based on whether the material is in storage or in use in a closed or open system. Definitions of both closed and open systems are found in Section 307.2. Within these subdivisions, the appropriate maximum allowable quantity per control area is listed in accordance with the physical state (solid, liquid or gas) of the material. A column for gas in open systems is not indicated because hazardous gaseous materials should not be allowed in a system that is continuously open to the atmosphere. While hazardous materials within a closed or open system are considered to be in use, Note b clearly indicates that the aggregate quantity of hazardous materials in use and storage within a given control area should not exceed the quantity listed in Table 307.7(1) for storage. Without Note c, many common alcoholic beverages and household products containing a negligible amount of a hazardous material could result in a Group M occupancy being classified as a high hazard. Note c recognizes the reduced hazard of the materials based on their water miscibility and limited container size. Notes d and e of Table 307.1(1) are significant in that, for certain materials, the maximum allowable amount may be increased due to the use of approved hazardous material storage cabinets, sprinklers or both. The notes are intended to be cumulative in that up to four times the base maximum quantity may be allowed per control area, if both sprinklered and in cabinets, without classifying the building as Group H. While the use of cabinets is not always a feasible or practical method of storage, they do provide additional protection to warrant an increase if provided. Construction requirements for hazardous material storage cabinets are contained in the IFC.

While classified as a hazardous material, the code

recognizes the relative hazard of Class IIIB liquids as compared to that of other flammable and combustible liquids by establishing a base maximum allowable quantity per control area of 13,200 gallons (49 962 L). As indicated in Note f, the quantity of Class I oxidizers and Class IIIB liquids would not be limited, provided the building is fully sprinklered in accordance with NFPA 13. Since any building that exceeds this maximum amount would be required to be classified as Group H and these buildings are required to be sprinklered, the maximum allowable amount would then be unlimited. As such, a Group H classification would not be warranted. The hazard presented by Class I oxidizers is that they slightly increase the burning rate of combustible materials that they may come into contact with during a fire. Class IIIB combustible liquids have flash points at or above 200°F (93°C). Motor oil is a typical example of a Class IIIB combustible liquid.

Note g recognizes that the hazard presented by certain materials is such that they may be stored or used only inside buildings that are fully sprinklered.

Note h clarifies for the user that while there is a combination maximum allowable quantity for flammable liquids, no individual class of liquid (Class IA, IB or IC) may exceed its own individual maximum allowable quantity.

Note i is a specific exception for maximum 660-gallon (2498 L) inside storage tanks of combustible liquids that are connected to a fuel-oil piping system. This exception applies to most oil-fired stationary equipment, whether in industrial, commercial or residential occupancies. NFPA 31 provides further guidance on the type of installations this exception is intending to permit. Note i provides consistency with Sections 603.3.2 and 3401.2 of the IFC for inside storage.

Note k permits a larger amount of Class 3 oxidizers in a building when used for maintenance and health purposes. The quantities proposed are reasonable for occupancies such as the health care industry where Class 3 oxidizers are used for maintenance purposes, sterilization and sanitation of equipment and operation sanitation. The method used to store the oxidizers is subject to the evaluation and approval of the building official. Note k also provides consistency with Note k of Table 2703.1.1(1) of the IFC.

Note l clarifies that the 125 pounds (57 kg) of storage permitted for consumer fireworks represents the net weight of the pyrotechnic composition of the fireworks in a nonsprinklered building. This amount represents approximately 12½ shipping cases (less than one and one-half pallet loads) of fireworks in a nonsprinklered storage condition. In cases where the net weight of the pyrotechnic composition of the fireworks is unknown, 25 percent of the gross weight of the fireworks is to be used. The gross weight is to include the weight of the packaging.

Note n provides an exception when the amount of

hazardous material in storage and display in Group M and S occupancies meet the requirements of Section 414.2.4.

Note o clarifies that densely packed baled cotton is not considered a hazardous material when meeting the size and weight requirements of ISO 8115 and, as such, is not subject to the maximum allowable quantity per control area specified for combustible fibers.

Note p is added to clarify that vehicles with closed fuel systems should be treated no differently than machinery or equipment when considering the allowable quantities of materials within a building. This note also clarifies that the fuels contained within the fuel tanks of vehicles or motorized equipment are not to be considered when calculating the aggregate quantity of hazardous materials within a control area of a building. For example, when evaluating a parking garage with several hundred cars parked inside, the fuel tanks of vehicles are not counted. When motorized equipment, such as a floor buffer or forklift, is used, those fuels are not included as long as other code requirements are satisfied.

**TABLE 307.1(2).** See page 3-19.

❖ Table 307.1(2), similar to Table 307.1(1), specifies the maximum quantities of hazardous materials, liquids or chemicals allowed per control area before having to classify a part of the (or the entire) building as a high-hazard occupancy. Table 307.1(2), as referenced in Exception 1 of Section 307.1, contains materials classified as Group H-4 in accordance with Section 307.6. While the materials listed in this table are considered health hazards, some materials may also possess physical hazard characteristics more indicative of materials classified as Group H-1, H-2 or H-3.

The maximum allowable quantities per control area listed in Table 307.1(2) are indicative of industry practice and assume the materials are properly stored and handled in accordance with the IFC. Group H-4 materials, while indeed hazardous, are primarily considered a handling problem and do not possess the same fire, explosion or reactivity hazard associated with other hazardous materials. The base maximum allowable quantity per control area of 810 cubic feet (23 m<sup>3</sup>) for gases that are either corrosive or toxic is based on a standard-size chlorine cylinder. Without Note b,

many common household products containing a negligible amount of a hazardous material could result in a Group M occupancy being classified as a high-hazard. Note b recognizes the reduced hazard of the materials based on their water miscibility and limited container size. Where applicable, Notes e and f provide an increase in the base maximum allowable amount, similar to that in Table 307.1(1) [see commentary, Table 307.1(1)].

Note c provides an exception when the amount of hazardous material in storage and display in Group M and S occupancies meets the requirements of Section 414.2.4.

Note d clearly indicates that the aggregate quantity of hazardous materials in use and storage, within a given control area, cannot exceed the quantity listed in the table for storage. Note g exempts a building from a Group H-4 classification that contains no more than a single 150-pound (68 kg) cylinder per control area of anhydrous ammonia in an unsprinklered building and no more than two cylinders each containing 150 pounds (68 kg) or less in a single control area of a fully sprinklered building. Anhydrous ammonia, which has a very low density when unconfined, is approximately one-fifth the density of chlorine. Based on their respective LC<sub>50</sub> values, chlorine is also approximately 80 times more toxic than anhydrous ammonia. The use of cabinets is not recognized as a realistic method of storing cylinders of anhydrous ammonia.

Note h is significant in that, for certain materials, their hazard is so great that their maximum allowable quantity per control area may be stored in the building only when approved exhausted enclosures or gas cabinets are utilized.

**307.1.1 Hazardous materials.** Hazardous materials in any quantity shall conform to the requirements of this code, including Section 414, and the *International Fire Code*.

❖ The use of high-hazard materials must be regulated in accordance with Section 414 as well as the applicable requirements of the IFC. While the building may be exempt from a high-hazard occupancy classification (i.e., Group H-1, H-2, H-3, H-4 or H-5), any potential hazard with regard to the use of storage of any hazardous material, regardless of quantity, must be abated.

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[F] TABLE 307.1(1) MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD<sup>a, j, m, n, p</sup>

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE <sup>b</sup>			USE-CLOSED SYSTEMS <sup>b</sup>			USE-OPEN SYSTEMS <sup>b</sup>		
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Liquid gallons (pounds)
Combustible liquid <sup>c, i</sup>	II	H-2 or H-3	N/A	120 <sup>d, e</sup>	N/A	N/A	N/A	120 <sup>d</sup>	N/A	N/A	30 <sup>d</sup>
	IIIA IIIB	H-2 or H-3 N/A	N/A	330 <sup>d, e</sup> 13,200 <sup>e, f</sup>	N/A	N/A	N/A	330 <sup>d</sup> 13,200 <sup>f</sup>	N/A	N/A	80 <sup>d</sup> 3,300 <sup>f</sup>
Combustible fiber	Loose baled <sup>o</sup>	H-3	(100) (1,000)	N/A	N/A	N/A	(100) (1,000)	N/A	N/A	(20) (200)	N/A
Consumer fireworks (Class C, Common)	1.4G	H-3	125 <sup>d, e, 1</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cryogenics flammable	N/A	H-2	N/A	45 <sup>d</sup>	N/A	N/A	N/A	45 <sup>d</sup>	N/A	N/A	10 <sup>d</sup>
Cryogenics, oxidizing	N/A	H-3	N/A	45 <sup>d</sup>	N/A	N/A	N/A	45 <sup>d</sup>	N/A	N/A	10 <sup>d</sup>
Explosives	Division 1.1	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>	N/A	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>
	Division 1.2	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>	N/A	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>
	Division 1.3	H-1 or 2	5 <sup>e, g</sup>	(5) <sup>e, g</sup>	N/A	N/A	1 <sup>g</sup>	(1) <sup>g</sup>	N/A	1 <sup>g</sup>	(1) <sup>g</sup>
	Division 1.4	H-3	50 <sup>e, g</sup>	(50) <sup>e, g</sup>	N/A	N/A	50 <sup>g</sup>	(50) <sup>g</sup>	N/A	N/A	N/A
	Division 1.4G	H-3	125 <sup>d, e, 1</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Division 1.5 Division 1.6	H-1 H-1	1 <sup>e, g</sup> 1 <sup>d, e, g</sup>	(1) <sup>e, g</sup> N/A	N/A	N/A	0.25 <sup>g</sup> N/A	(0.25) <sup>g</sup> N/A	N/A	0.25 <sup>g</sup> N/A	(0.25) <sup>g</sup> N/A
Flammable gas	Gaseous liquefied	H-2	N/A	N/A	1,000 <sup>d, e</sup> N/A	N/A	N/A	N/A	1,000 <sup>d, e</sup> N/A	N/A	N/A
Flammable liquid <sup>c</sup>	1A 1B and 1C	H-2 or H-3	N/A	30 <sup>d, e</sup> 120 <sup>d, e</sup>	N/A	N/A	N/A	30 <sup>d</sup> 120 <sup>d</sup>	N/A	N/A	10 <sup>d</sup> 30 <sup>d</sup>
Combination flammable liquid (1A, 1B, 1C)	N/A	H-2 or H-3	N/A	120 <sup>d, e, h</sup>	N/A	N/A	N/A	120 <sup>d, h</sup>	N/A	N/A	30 <sup>d, h</sup>
Flammable solid	N/A	H-3	125 <sup>d, e</sup>	N/A	N/A	N/A	125 <sup>d</sup>	N/A	N/A	25 <sup>d</sup>	N/A
Organic peroxide	UD	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>	N/A	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>
	I	H-2	5 <sup>d, e</sup>	(5) <sup>d, e</sup>	N/A	N/A	1 <sup>d</sup>	(1) <sup>d</sup>	N/A	1 <sup>d</sup>	(1) <sup>d</sup>
	II	H-3	50 <sup>d, e</sup>	(50) <sup>d, e</sup>	N/A	N/A	50 <sup>d</sup>	(50) <sup>d</sup>	N/A	10 <sup>d</sup>	(10) <sup>d</sup>
	III	H-3	125 <sup>d, e</sup>	(125) <sup>d, e</sup>	N/A	N/A	125 <sup>d</sup>	(125) <sup>d</sup>	N/A	25 <sup>d</sup>	(25) <sup>d</sup>
	IV V	N/A N/A	NL NL	NL NL	N/A N/A	N/A N/A	N/L N/L	N/L N/L	N/A N/A	NL NL	NL NL
Oxidizer	4	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>	N/A	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>
	3 <sup>k</sup>	H-2 or H-3	10 <sup>d, e</sup>	(10) <sup>d, e</sup>	N/A	N/A	2 <sup>d</sup>	(2) <sup>d</sup>	N/A	2 <sup>d</sup>	(2) <sup>d</sup>
	2	H-3	250 <sup>d, e</sup>	(250) <sup>d, e</sup>	N/A	N/A	250 <sup>d</sup>	(250) <sup>d</sup>	N/A	50 <sup>d</sup>	(50) <sup>d</sup>
Oxidizing gas	1	N/A	4,000 <sup>e, f</sup>	(4,000) <sup>e, f</sup>	N/A	N/A	4,000 <sup>f</sup>	(4,000) <sup>f</sup>	N/A	1,000 <sup>f</sup>	(1,000) <sup>f</sup>
	Gaseous liquefied	H-3	N/A	N/A	1,500 <sup>d, e</sup> N/A	N/A	N/A	N/A	1,500 <sup>d, e</sup> N/A	N/A	N/A

(continued)



[F] TABLE 307.1(1)—continued  
 MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD<sup>a, i, m, n, p</sup>

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE <sup>b</sup>			USE-CLOSED SYSTEMS <sup>b</sup>				USE-OPEN SYSTEMS <sup>b</sup>		
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)
Pyrophoric material	N/A	H-2	4 <sup>c, g</sup>	(4) <sup>c, g</sup>	50 <sup>c, g</sup>	1 <sup>g</sup>	(1) <sup>g</sup>	10 <sup>c, g</sup>	0	0	0	0
Unstable (reactive)	4	H-1	1 <sup>c, g</sup>	(1) <sup>c, g</sup>	10 <sup>d, g</sup>	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	2 <sup>c, g</sup>	0.25 <sup>g</sup>	2 <sup>c, g</sup>	(0.25) <sup>g</sup>	(0.25) <sup>g</sup>
	3	H-1 or H-2	5 <sup>d, e</sup>	(5) <sup>d, e</sup>	50 <sup>d, e</sup>	1 <sup>d</sup>	(1)	10 <sup>d, e</sup>	1 <sup>d</sup>	10 <sup>d, e</sup>	(1) <sup>d</sup>	(1) <sup>d</sup>
	2	H-3	50 <sup>d, e</sup>	(50) <sup>d, e</sup>	250 <sup>d, e</sup>	50 <sup>d</sup>	(50) <sup>d</sup>	250 <sup>d, e</sup>	10 <sup>d</sup>	250 <sup>d, e</sup>	(10) <sup>d</sup>	(10) <sup>d</sup>
	1	N/A	NL	NL	N/L	NL	N/L	NL	NL	NL	NL	NL
Water reactive	3	H-2	5 <sup>d, e</sup>	(5) <sup>d, e</sup>	N/A	5 <sup>d</sup>	(5) <sup>d</sup>	N/A	1 <sup>d</sup>	N/A	1 <sup>d</sup>	(1) <sup>d</sup>
	2	H-3	50 <sup>d, e</sup>	(50) <sup>d, e</sup>	N/A	50 <sup>d</sup>	(50) <sup>d</sup>	N/A	10 <sup>d</sup>	N/A	10 <sup>d</sup>	(10) <sup>d</sup>
	1	N/A	NL	NL	N/A	NL	NL	N/A	NL	N/A	NL	NL

For SI: 1 cubic foot = 0.023 m<sup>3</sup>, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NL = Not Limited; N/A = Not Applicable; UD = Unclassified Detonable

a. For use of control areas, see Section 414.2.

b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs, consumer or industrial products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, day boxes, gas cabinets, exhausted enclosures or safety cans. Where Note d also applies, the increase for both notes shall be applied accumulatively.

f. The permitted quantities shall not be limited in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

g. Permitted only in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

h. Containing not more than the maximum allowable quantity per control area of Class IA, IB or IC flammable liquids.

i. Inside a building, the maximum capacity of a combustible liquid storage system that is connected to a fuel-oil piping system shall be 660 gallons provided such system complies with the *International Fire Code*.

j. Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.

k. A maximum quantity of 200 pounds of solid or 20 gallons of liquid Class 3 oxidizers is allowed when such materials are necessary for maintenance purposes, operation or sanitation of equipment. Storage containers and the manner of storage shall be approved.

l. Net weight of the pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks, including packaging, shall be used.

m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 2703.1.2 of the *International Fire Code*.

n. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 414.2.5, see Tables 414.2.5(1) and 414.2.5(2).

o. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.

p. The following shall not be included in determining the maximum allowable quantities:

1. Liquid or gaseous fuel in fuel tanks on vehicles.
2. Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with this code.
3. Gaseous fuels in piping systems and fixed appliances regulated by the *International Fuel Gas Code*.
4. Liquid fuels in piping systems and fixed appliances regulated by the *International Mechanical Code*.

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[F] TABLE 307.1(2)  
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIAL POSING A HEALTH HAZARD<sup>a, b, c, j</sup>

MATERIAL	STORAGE <sup>d</sup>			USE-CLOSED SYSTEMS <sup>d</sup>			USE-OPEN SYSTEMS <sup>d</sup>	
	Solid pounds <sup>e, f</sup>	Liquid gallons (pounds) <sup>e, f</sup>	Gas (cubic feet at NTP) <sup>e</sup>	Solid pounds <sup>e</sup>	Liquid gallons (pounds) <sup>e</sup>	Gas (cubic feet at NTP) <sup>e</sup>	Solid pounds <sup>e</sup>	Liquid gallons (pounds) <sup>e</sup>
Corrosive	5,000	500	810 <sup>f, g</sup>	5,000	500	810 <sup>f, g</sup>	1,000	100
Highly toxic	10	(10) <sup>i</sup>	20 <sup>h</sup>	10	(10) <sup>i</sup>	20 <sup>h</sup>	3	(3) <sup>i</sup>
Toxic	500	(500) <sup>i</sup>	810 <sup>f</sup>	500	(500) <sup>i</sup>	810 <sup>f</sup>	125	(125) <sup>i</sup>

For SI: 1 cubic foot = 0.028 m<sup>3</sup>, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

- For use of control areas, see Section 414.2.
- In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs, consumer or industrial products, and cosmetics, containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.
- For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 414.2.5, see Tables 414.2.5(1) and Tables 414.2.5(2).
- The aggregate quantity in use and storage shall not exceed the quantity listed for storage.
- Quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note f also applies, the increase for both notes shall be applied accumulatively.
- Quantities shall be increased 100 percent when stored in approved storage cabinets, gas cabinets or exhausted enclosures as specified in the *International Fire Code*. Where Note e also applies, the increase for both notes shall be applied accumulatively.
- A single cylinder containing 150 pounds or less of anhydrous ammonia in a single control area in a nonsprinklered building shall be considered a maximum allowable quantity. Two cylinders, each containing 150 pounds or less in a single control area, shall be considered a maximum allowable quantity provided the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
- Allowed only when stored in approved exhausted gas cabinets or exhausted enclosures as specified in the *International Fire Code*.
- Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.
- For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 2703.1.2 of the *International Fire Code*.

[F] **307.2 Definitions.** The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

- ❖ Definitions of terms that are associated with the content of this section are contained herein. These definitions can help in the understanding and application of the code requirements. It is important to emphasize that these terms are not exclusively related to this section but are applicable everywhere the term is used in the code. The purpose for including these definitions within this section is to provide more convenient access to them without having to refer back to Chapter 2.

For convenience, these terms are also listed in Chapter 2 with a cross reference to this section. The use and application of all defined terms, including those defined herein, are set forth in Section 201.

**AEROSOL.** A product that is dispensed from an aerosol container by a propellant.

Aerosol products shall be classified by means of the calculation of their chemical heats of combustion and shall be designated Level 1, 2 or 3.

**Level 1 aerosol products.** Those with a total chemical heat of combustion that is less than or equal to 8,600 British thermal units per pound (Btu/lb) (20 kJ/g).

**Level 2 aerosol products.** Those with a total chemical heat of combustion that is greater than 8,600 Btu/lb (20 kJ/g), but less than or equal to 13,000 Btu/lb (30 kJ/g).

**Level 3 aerosol products.** Those with a total chemical heat of combustion that is greater than 13,000 Btu/lb (30 kJ/g).

- ❖ The intent of the code is to regulate those aerosols that contain a flammable propellant, such as butane, iso-

butane or propane. An aerosol product such as whipped cream is a water-based material with a non-flammable propellant (nitrous oxide) and would, therefore, not be regulated as a hazardous material. The contents of the aerosol container may be dispensed in the form of a mist spray, foam, gel or aerated powder.

Because of the wide range of flammability of aerosol products, a classification system was established to determine the required level of fire protection. Categories are defined according to the aerosol's chemical heat of combustion expressed in Btus per pound (Btu/lb). Aerosol category classifications of Levels 1, 2 and 3 are used to avoid confusion with flammable liquid classifications.

Examples of Level 1 aerosol products are shaving gel, whipped cream and air fresheners. Level 1 aerosols are not regulated as a hazardous material and are essentially exempt from the requirements of this chapter. Examples of Level 2 aerosols include some hair sprays and insect repellents. Level 3 aerosols include carburetor cleaner and other petroleum-based aerosols.

While aerosols are defined as hazardous materials, note that they are not listed in Table 307.1(1) or 307.1(2) as having a maximum allowable quantity per control area. As stated in Exception 13 to Section 307.1, a building or structure used for aerosol storage is classified as Group S-1, provided the requirements of the IFC are satisfied; therefore, the Group H classification is not utilized since the design must satisfy the IFC in order to be in compliance.

**AEROSOL CONTAINER.** A metal can or a glass or plastic bottle designed to dispense an aerosol. Metal cans shall be limited to a maximum size of 33.8 fluid ounces (1,000 ml). Glass

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or plastic bottles shall be limited to a maximum size of 4 fluid ounces (118 ml).

- ❖ All design criteria for the aerosol container, including the maximum size and minimum strength, are set by the U.S. Department of Transportation (DOT 49 CFR). These container regulations are essential for safe transportation of aerosol products.

**BALED COTTON.** A natural seed fiber wrapped in and secured with industry accepted materials, usually consisting of burlap, woven polypropylene, polyethylene or cotton or sheet polyethylene, and secured with steel, synthetic or wire bands or wire; also includes linters (lint removed from the cottonseed) and motes (residual materials from the ginning process).

- ❖ This definition of standard "Baled cotton" is being included only to distinguish it from "Baled cotton, densely packed" (see commentary to the definition of "Baled cotton, densely packed"). The Joint Cotton Industry Bale Packaging Committee (JCIBPC) is a committee that represents all parts of the cotton industry and sets standards and specifications for packaging of cotton bales that include bale density. The JCIBPC specifications for baling of cotton require that all cotton bales be secured with fixed length wire bands, polyester plastic strapping or cold rolled high tensile steel strapping and then covered in fully-coated woven polyolefin, polyethylene film or burlap.

**BALED COTTON, DENSELY PACKED.** Cotton made into banded bales with a packing density of at least 22 pounds per cubic foot (360 kg/m<sup>3</sup>), and dimensions complying with the following: a length of 55 inches (1397 ± 20 mm), a width of 21 inches (533.4 ± 20 mm) and a height of 27.6 to 35.4 inches (701 to 899 mm).

- ❖ Currently, over 99 percent of all U.S. cotton is pressed and stored as densely packed baled cotton, with bales meeting the weight and dimension requirements of ISO 8115. One reason that the cotton industry has chosen to use mostly such bales is because they are very difficult to ignite, which allows the industry to transport them without being labeled as "flammable solids" or "dangerous goods" by the national or international transport authorities. It is intended that this definition be used to distinguish such bales from other combustible fibers.

In order to counteract some erroneous information regarding the combustibility characteristics of densely packed cotton bales, flammability research was conducted on baled cotton. The research demonstrated that densely packed baled cotton meeting the size and weight requirements of ISO 8115 is not a hazardous material. In view of that data, the U.S. Department of Transportation (U.S. Coast Guard), the United Nations (U.N.) and the International Maritime Organization (IMO) have all removed the listing of baled cotton from the list of hazardous materials and from the list of flammable solids, provided the cotton bales are the

densely packed type that meet the standard noted above. The research conclusions were:

1. Standard cotton fiber "passed" the Department of Transportation's spontaneous combustion test: the cotton did not exceed the oven temperature and was not classified as self-heating.
2. Cotton, as densely packed baled cotton, did not cause sustained smoldering propagation: an electric heater placed within the bales was unable to cause sustained smoldering propagation, because of the lack of oxygen inside the densely packed bale.
3. Cotton, as densely packed baled cotton, was exposed to ignition from a cigarette and a match and performed very well: no propagating combustion with either.
4. Cotton, as densely packed baled cotton, was exposed to ignition from the gas burner source in ASTM E 1590 (also known as California Technical Bulletin 129) of 12 L/min of propane gas for 180 seconds and passed all the criteria, including mass loss of less than 1.36 kg (3 pounds), heat release rate less than 100 kw and total heat release of less than 25 MJ in the first 10 minutes of the test.

**BARRICADE.** A structure that consists of a combination of walls, floor and roof, which is designed to withstand the rapid release of energy in an explosion and which is fully confined, partially vented or fully vented; or other effective method of shielding from explosive materials by a natural or artificial barrier.

**Artificial barricade.** An artificial mound or revetment a minimum thickness of 3 feet (914 mm).

**Natural barricade.** Natural features of the ground, such as hills, or timber of sufficient density that the surrounding exposures that require protection cannot be seen from the magazine or building containing explosives when the trees are bare of leaves.

- ❖ The use of barricades provides an alternative method of explosion control by minimizing the potential damage due to blast effects and flying debris in the event of an explosion (see Section 414.5.1). Depending on the detonable hazard involved, an effective barricade may be a blast-resistant structure or natural or artificial barrier as provided for in Chapter 34 of the IFC for the storage of explosives.

**BOILING POINT.** The temperature at which the vapor pressure of a liquid equals the atmospheric pressure of 14.7 pounds per square inch (psi) (101 kPa) gage or 760 mm of mercury. Where an accurate boiling point is unavailable for the material in question, or for mixtures which do not have a constant boiling point, for the purposes of this classification, the 20-percent



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evaporated point of a distillation performed in accordance with ASTM D 86 shall be used as the boiling point of the liquid.

- ❖ The boiling point of a liquid is significant in determining the appropriate division for Class I flammable liquids. Temperatures above the established boiling point for a given liquid would result in the atmospheric pressure no longer being able to keep the liquid in a liquid state. Liquids with low boiling points present a greater fire hazard because of the increased vapor pressure at normal ambient temperatures.

**CLOSED SYSTEM.** The use of a solid or liquid hazardous material involving a closed vessel or system that remains closed during normal operations where vapors emitted by the product are not liberated outside of the vessel or system and the product is not exposed to the atmosphere during normal operations; and all uses of compressed gases. Examples of closed systems for solids and liquids include product conveyed through a piping system into a closed vessel, system or piece of equipment.

- ❖ The difference between a closed system and an open system is whether the hazardous material involved in the process is exposed to the atmosphere. While not specific in the definition, certain gases are also allowed in closed systems, as indicated in Tables 307.7(1) and 307.7(2). Materials in closed or open systems are assumed to be "in use" as opposed to "in storage." Gases are always assumed to be in closed systems, since they would be immediately dispersed in an open system if exposed to the atmosphere without some means of containment (see the definition of "Open system").

**COMBUSTIBLE DUST.** Finely divided solid material that is 420 microns or less in diameter and which, when dispersed in air in the proper proportions, could be ignited by a flame, spark or other source of ignition. Combustible dust will pass through a U.S. No. 40 standard sieve.

- ❖ Combustible dusts are combustible solids in a finely divided state that are suspended in the air. An explosion hazard exists when the concentration of the combustible dust is within the explosive limits and exposed to an ignition source of sufficient energy and duration to initiate self-sustained combustion. A review of the occupancy classification for Group H-2 in Section 307.4 indicates that combustible dusts are classified in that occupancy group. The intent of that section is that when combustible dust is determined by an engineering analysis to meet the definition parameter that, in a given occupancy, it is dispersed in air in the proper proportions so as to be ignitable by an ignition source, then the deflagration hazard is sufficient to classify the occupancy in Group H-2. Combustible dust, as a material, that does not rise to that defined level of hazard in a particular building would not cause the building or portion thereof housing the hazard to be classified in Group H-2, but rather in the group that is most appropriate for the particular operation.

The tabular Maximum Allowable Quantity per Control Area (MAQ) (formerly called "exempt amounts")

for combustible dust, previously included in the legacy building and fire codes, was deleted because of its questionable value given the complexities of dust explosion hazards. Determining a theoretical MAQ of combustible dust and the potential for a dust explosion requires a thorough evaluation and technical report based on the provisions of Section 104.7.2 of the IFC. Such determination is complex and requires evaluation far beyond the simple 1 pound per 1,000 cubic feet exempt amount/MAQ previously used by the legacy codes. Critical factors, such as particle size, material density, humidity and oxygen concentration, play a major role in the evaluation of the dust hazard and are much too complex to be simply addressed.

**COMBUSTIBLE FIBERS.** Readily ignitable and free-burning materials in a fibrous or shredded form, such as cocoa fiber, cloth, cotton, excelsior, hay, hemp, henequen,istle, jute, kapok, oakum, rags, sisal, Spanish moss, straw, tow, wastepaper, certain synthetic fibers or other like materials. This definition does not include densely packed baled cotton.

- ❖ Operations involving combustible fibers are typically associated with paper milling, recycling, cloth manufacturing, carpet and textile mills and agricultural operations, among others. The primary hazards associated with such operations involve the abundance of materials and their ready ignitability. Many organic fibers are prone to spontaneous ignition if improperly dried and kept in areas without sufficient ventilation. Densely packed baled cotton is a special type of combustible fiber that, based on its weight and dimension requirements, is not easily ignitable and is not a hazardous material.

**COMBUSTIBLE LIQUID.** A liquid having a closed cup flash point at or above 100°F (38°C). Combustible liquids shall be subdivided as follows:

**Class II.** Liquids having a closed cup flash point at or above 100°F (38°C) and below 140°F (60°C).

**Class IIIA.** Liquids having a closed cup flash point at or above 140°F (60°C) and below 200°F (93°C).

**Class IIIB.** Liquids having a closed cup flash point at or above 200°F (93°C).

The category of combustible liquids does not include compressed gases or cryogenic fluids.

- ❖ Combustible liquids differ from flammable liquids in that the closed cup flash point of all combustible liquids is at or above 100°F (38°C) (see the definition of "Flash point"). There are three categories of combustible liquids. The range of their closed-cup flash point dictates the class of combustible liquid. The flash point range of 100° F (38°C) to 140°F (60°C) for Class II liquids is based on a possible indoor ambient temperature exceeding 100° F (38°C). Only a moderate degree of heating would be required to bring the liquid to its flash point in this type of condition. Class III liquids, which have flash points higher than 140°F (38°C), would require a significant heat source besides ambient temperature conditions to reach their flash point



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(see the definition of "Flammable liquid"). Class IIIA has a closed-cup flash point range of 140°F (93°C). Class IIIB has a closed cup flash point at or above 200°F (93°C). Combustible liquids are primarily considered Group H-2 materials except for Class II and IIIA liquids that are considered Group H-3 when used or stored in normally closed containers or systems pressurized at less than 15 psig (103.4 kPa). Motor oil is a typical example of a Class IIIB combustible liquid. Note that Class IIIB liquids are not regulated to be classified as Group H per Table 307.1(1). While cryogenic fluids and compressed gases may be combustible, they are to be regulated separately from combustible liquids.

**COMPRESSED GAS.** A material, or mixture of materials which:

1. Is a gas at 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure; and
2. Has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa) which is either liquefied, nonliquefied or in solution, except those gases which have no other health- or physical-hazard properties are not considered to be compressed until the pressure in the packaging exceeds 41 psia (282 kPa) at 68°F (20°C).

The states of a compressed gas are categorized as follows:

1. Nonliquefied compressed gases are gases, other than those in solution, which are in a packaging under the charged pressure and are entirely gaseous at a temperature of 68°F (20°C).
  2. Liquefied compressed gases are gases that, in a packaging under the charged pressure, are partially liquid at a temperature of 68°F (20°C).
  3. Compressed gases in solution are nonliquefied gases that are dissolved in a solvent.
  4. Compressed gas mixtures consist of a mixture of two or more compressed gases contained in a packaging, the hazard properties of which are represented by the properties of the mixture as a whole.
- ❖ This term refers to all types of gases that are under pressure at normal room or outdoor temperatures inside their containers, including, but not limited to, flammable, nonflammable, highly toxic, toxic, cryogenic and liquefied gases. The vapor pressure limitations provide the distinction between a liquid and a gas. Gases are materials that boil at a temperature of 68°F (20°C) or less at a pressure of 14.7 psia (101.3 kPa). Liquefied and nonliquefied compressed gases are determined by the state of the gas at a temperature of 68°F (20°C). Nonliquefied gases are entirely gaseous, while liquefied gases are partially liquid.

**CONTROL AREA.** Spaces within a building where quantities of hazardous materials not exceeding the maximum allowable quantities per control area are stored, dispensed, used or

handled. See also the definition of "Outdoor control area" in the *International Fire Code*.

❖ The use of control areas provides an alternative method for the use and storage of hazardous materials without classifying the building or structure as a high-hazard occupancy (Group H). This concept is based on regulating the allowable quantities of hazardous materials per control area, rather than per building area, by giving credit for further compartmentation through the use of fire barriers and horizontal assemblies having a minimum fire-resistance rating of 1 hour. The maximum quantities of hazardous materials within a given control area cannot exceed the amounts for a given material listed in either Table 307.1(1) or 307.1(2) (see commentary, Section 414.2). Control areas are not limited to within buildings. A storage area that is exposed to the elements (wind, rain, snow, etc.) also cannot exceed the maximum allowable quantity per control area.

**CORROSIVE.** A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the point of contact. A chemical shall be considered corrosive if, when tested on the intact skin of albino rabbits by the method described in DOTn 49 CFR, Part 173.137, such a chemical destroys or changes irreversibly the structure of the tissue at the point of contact following an exposure period of 4 hours. This term does not refer to action on inanimate surfaces.

❖ This definition is derived from DOL 29 CFR; Part 1910.1200. While corrosive materials do not present a fire, explosion or reactivity hazard, they do pose a handling and storage problem. Corrosive materials, therefore, are primarily considered a health hazard and are classified as Group H-4 material. Many corrosive chemicals are also strong oxidizing agents that require classification as a multiple hazard in accordance with Section 307.8.

**CRYOGENIC FLUID.** A liquid having a boiling point lower than -150°F (-101°C) at 14.7 pounds per square inch atmosphere (psia) (an absolute pressure of 101 kPa).

❖ Cryogenic fluids present a hazard because they are extremely cold. Should a spill occur, their extremely cold temperature affects other compounds exposed to the spilled cryogenic fluid. Cryogenic fluids may be flammable or nonflammable; however, nonflammable cryogenics may possess properties that cause them to support combustion or react severely with other materials. The code is only intended to classify flammable or oxidizing cryogenic fluids as a hazardous material.

**DAY BOX.** A portable magazine designed to hold explosive materials constructed in accordance with the requirements for a Type 3 magazine as defined and classified in Chapter 33 of the *International Fire Code*.

❖ A day box is an explosive magazine that is listed in Note e of Table 307.1(1).

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**DEFLAGRATION.** An exothermic reaction, such as the extremely rapid oxidation of a flammable dust or vapor in air, in which the reaction progresses through the unburned material at a rate less than the velocity of sound. A deflagration can have an explosive effect.

❖ Materials that present a deflagration hazard usually burn very rapidly with the release of energy from a chemical reaction in the form of intense heat. Confined deflagration hazards under pressure can result in an explosion. Most hazardous materials that pose a severe deflagration hazard are classified as Group H-2 in accordance with Section 307.4 (see the definition of "Detonation").

**DETACHED BUILDING.** A separate single-story building, without a basement or crawl space, used for the storage or use of hazardous materials and located an approved distance from all structures.

❖ This term is used to define the type of structure the code recognizes for the use and storage of hazardous materials in excess of the maximum allowable quantity per control area. While the definition addresses all hazardous materials, a detached storage building is only required for Group H-1, H-2 and H-3 structures as indicated in Sections 415.3.2, 415.4 and 508.3 and Table 415.3.2. The location of the structure is regulated by Section 415.3.1 and Table 415.3.1.

**DETONATION.** An exothermic reaction characterized by the presence of a shock wave in the material which establishes and maintains the reaction. The reaction zone progresses through the material at a rate greater than the velocity of sound. The principal heating mechanism is one of shock compression. Detonations have an explosive effect.

❖ Detonations are distinguished from deflagrations (which are produced by explosive gases, dusts, vapors and mists) by the speed with which they propagate a blast effect. Detonations occur much faster than deflagrations, since they propagate a combustion zone at a velocity greater than the speed of sound. Deflagrations propagate a combustion zone at a velocity less than the speed of sound. The speed of sound is approximately 1,100 feet per second (336 m/s) at sea level. Both detonations and deflagrations may produce explosive results when they occur in a confined space. Materials that are considered a detonation hazard are classified as Group H-1 materials in accordance with Section 307.3.

**DISPENSING.** The pouring or transferring of any material from a container, tank or similar vessel, whereby vapors, dusts, fumes, mists or gases are liberated to the atmosphere.

❖ This term refers to a specific operation whereby the act of transferring a material occurs and that has a hazard associated with the liberation of the material in the forms listed in the definition. It is not "handling" and should not be confused with that term (see the definitions of "Closed system" and "Handling").

**EXPLOSIVE.** Any chemical compound, mixture or device, the primary or common purpose of which is to function by

explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters and display fireworks, 1.3G (Class B, Special).

The term "explosive" includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G (Class C, Common) by the hazardous materials regulations of DOTn 49 CFR.

**High explosive.** Explosive material, such as dynamite, which can be caused to detonate by means of a No. 8 test blasting cap when unconfined.

**Low explosive.** Explosive material that will burn or deflagrate when ignited. It is characterized by a rate of reaction that is less than the speed of sound. Examples of low explosives include, but are not limited to, black powder; safety fuse; igniters; igniter cord; fuse lighters; fireworks, 1.3G (Class B, Special) and propellants, 1.3C.

**Mass-detonating explosives.** Division 1.1, 1.2 and 1.5 explosives alone or in combination, or loaded into various types of ammunition or containers, most of which can be expected to explode virtually instantaneously when a small portion is subjected to fire, severe concussion, impact, the impulse of an initiating agent or the effect of a considerable discharge of energy from without. Materials that react in this manner represent a mass explosion hazard. Such an explosive will normally cause severe structural damage to adjacent objects. Explosive propagation could occur immediately to other items of ammunition and explosives stored sufficiently close to and not adequately protected from the initially exploding pile with a time interval short enough so that two or more quantities must be considered as one for quantity-distance purposes.

**UN/DOTn Class 1 explosives.** The former classification system used by DOTn included the terms "high" and "low" explosives as defined herein. The following terms further define explosives under the current system applied by DOTn for all explosive materials defined as hazard Class 1 materials. Compatibility group letters are used in concert with the division to specify further limitations on each division noted (i.e., the letter G identifies the material as a pyrotechnic substance or article containing a pyrotechnic substance and similar materials).

**Division 1.1.** Explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.

**Division 1.2.** Explosives that have a projection hazard but not a mass explosion hazard.

**Division 1.3.** Explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.

**Division 1.4.** Explosives that pose a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.

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**Division 1.5.** Very insensitive explosives. This division is comprised of substances that have a mass explosion hazard, but that are so insensitive there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.

**Division 1.6.** Extremely insensitive articles which do not have a mass explosion hazard. This division is comprised of articles that contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation.

- ❖ Explosives either detonate or deflagrate when initiated by either heat, shock or electric current. While these materials are normally designed and intended to be initiated by detonators under controlled conditions, heat, shock and electric current from uncontrolled sources may initiate these materials to produce an explosion. DOTn classifies explosives in six classes according to the degree of hazard posed by the material. The most dangerous of these materials is capable of almost simultaneous detonation of all of the material in a single load or store. The least-sensitive explosives produce blasts limited to the packages in which they are transported. This definition of explosives includes materials such as detonators, blasting agents and water gels; examples of these materials are listed in DOTy 27 CFR 55.23.

Explosive materials are subdivided into high, low, mass detonating and UN/DOTn Class 1 explosives. High explosives and mass detonating explosives are typically classified as Group H-1 and present a detonation hazard. Low explosives more commonly are classified as Group H-2, as they tend to deflagrate or burn upon ignition. Mass detonating devices present a greater threat to adjacent objects and structures. The IFC, therefore, contains provisions in the form of Table 3305.3 to deal with the separation distances for mass explosion hazards.

The definitions cited in this section are consistent with DOTn 49 CFR; Section 173.50. The hazards of this group of materials vary with the nature of the material, with some explosives being very sensitive and others less sensitive. Some explosives detonate, others deflagrate and the hazards of others are limited to intense burning. The classification system was designed to correlate with the system of classification developed under recommendations of the United Nations (UN), wherein all explosive materials are placed into a hazard class of Class 1. This class is further divided into six divisions: Divisions 1.1 through 1.6.

**FIREWORKS.** Any composition or device for the purpose of producing a visible or audible effect for entertainment purposes by combustion, deflagration or detonation that meets the definition of 1.4G fireworks or 1.3G fireworks as set forth herein.

- ❖ Any device containing an explosive material that produces an audible or visible effect through combustion, deflagration, detonation or explosion is considered a

firework. Fireworks are divided into two categories, 1.4G and 1.3G, based on the amount of pyrotechnic composition present.

**FIREWORKS, 1.3G.** (Formerly Class B, Special Fireworks.) Large fireworks devices, which are explosive materials, intended for use in fireworks displays and designed to produce audible or visible effects by combustion, deflagration or detonation. Such 1.3G fireworks include, but are not limited to, firecrackers containing more than 130 milligrams (2 grains) of explosive composition, aerial shells containing more than 40 grams of pyrotechnic composition, and other display pieces which exceed the limits for classification as 1.4G fireworks. Such 1.3G fireworks are also described as fireworks, UN0335 by the DOTn.

- ❖ The definitions of “1.4G fireworks” and “1.3G fireworks” are derived from the U.S. Department of Transportation (DOTn 49 CFR) clarification system for transporting explosives and from NFPA 1124. The amount of pyrotechnic composition is the distinguishing factor between the two types of fireworks (see commentary to the definition of “Pyrotechnic composition”). Fireworks that contain a limited amount of pyrotechnic composition are classified as 1.4G fireworks. 1.4G fireworks represent a physical hazard (Group H-3), while display fireworks represent a detonation hazard (Group H-1).

**FIREWORKS, 1.4G.** (Formerly Class C, Common Fireworks.) Small fireworks devices containing restricted amounts of pyrotechnic composition designed primarily to produce visible or audible effects by combustion. Such 1.4G fireworks which comply with the construction, chemical composition and labeling regulations of the DOTn for fireworks, UN0336, and the U.S. Consumer Product Safety Commission (CPSC) as set forth in CPSC 16 CFR: Parts 1500 and 1507, are not explosive materials for the purpose of this code.

- ❖ The requirements for storage, display and labeling depend on the correct application of this definition. This definition reflects the construction, chemical composition and labeling requirements of the U.S. Consumer Product Safety Commission found in Title 16, Code of Federal Regulations, Parts 1500 and 1507. Also, 1.4G fireworks are not considered to be explosives in accordance with the provisions of Chapter 33 of the IFC.

**FLAMMABLE GAS.** A material that is a gas at 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure [a material that has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa)] which:

1. Is ignitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air; or
2. Has a flammable range at 14.7 psia (101 kPa) with air of at least 12 percent, regardless of the lower limit.

The limits specified shall be determined at 14.7 psi (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E 681.

- ❖ This term essentially refers to any type of compressed gas that burns in normal concentrations of oxygen in the air (see the definition of “Compressed gas”). The



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definition is consistent with the provisions of ASTM E 681.

**FLAMMABLE LIQUEFIED GAS.** A liquefied compressed gas which, under a charged pressure, is partially liquid at a temperature of 68°F (20°C) and which is flammable.

❖ This term essentially refers to any type of liquefied compressed gas that burns in normal concentrations of oxygen in the air (see the definition of “Compressed gas”).

**FLAMMABLE LIQUID.** A liquid having a closed cup flash point below 100°F (38°C). Flammable liquids are further categorized into a group known as Class I liquids. The Class I category is subdivided as follows:

**Class IA.** Liquids having a flash point below 73°F (23°C) and a boiling point below 100°F (38°C).

**Class IB.** Liquids having a flash point below 73°F (23°C) and a boiling point at or above 100°F (38°C).

**Class IC.** Liquids having a flash point at or above 73°F (23°C) and below 100°F (38°C).

The category of flammable liquids does not include compressed gases or cryogenic fluids.

❖ While all flammable liquids have a closed cup flash point less than 100°F (38°C), the further classification of the Class I liquid is dependent on the boiling point (see the definition of “Boiling point”). The 100°F (38°C) flash point limitation for flammable liquids assumes possible indoor ambient temperature conditions of 100°F (38°C).

**FLAMMABLE MATERIAL.** A material capable of being readily ignited from common sources of heat or at a temperature of 600°F (316°C) or less.

❖ Many standardized tests, such as ASTM E 136 and NFPA 701a, have been developed to assess the flammability and fire hazards of materials. Both of these tests include objective criteria for evaluating the combustibility of different materials; however, great care must be taken in conducting and evaluating the results of such tests.

**FLAMMABLE SOLID.** A solid, other than a blasting agent or explosive, that is capable of causing fire through friction, absorption or moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which has an ignition temperature below 212°F (100°C) or which burns so vigorously and persistently when ignited as to create a serious hazard. A chemical shall be considered a flammable solid as determined in accordance with the test method of CPSC 16 CFR; Part 1500.44, if it ignites and burns with a self-sustained flame at a rate greater than 0.1 inch (2.5 mm) per second along its major axis.

❖ Flammable solids are combustible materials that ignite easily and burn rapidly. Solids that may cause a fire due to friction are considered flammable solids as well as metal powders that can be readily ignited. Exam-

ples of flammable solids include nitrocellulose and combustible metals, such as magnesium and titanium.

**FLASH POINT.** The minimum temperature in degrees Fahrenheit at which a liquid will give off sufficient vapors to form an ignitable mixture with air near the surface or in the container, but will not sustain combustion. The flash point of a liquid shall be determined by appropriate test procedure and apparatus as specified in ASTM D 56, ASTM D 93 or ASTM D 3278.

❖ The flash point is the characteristic used in the classification of flammable and combustible liquids. The Tag Closed Tester (ASTM D 56), the Pensky-Martens Closed Cup Tester (ASTM D 93) and the Small Scale Closed-Cup Apparatus (ASTM D 3278) are the referenced test procedures for determining the flash points of liquids. The applicability of the respective test method is dependent on the viscosity of the test liquid and the expected flash point.

**HANDLING.** The deliberate transport by any means to a point of storage or use.

❖ The term “handling” pertains to the transporting or movement of hazardous materials within a building. Handling presents a level of hazard that is of a lesser degree than that of use or dispensing operations but greater than storage. Material is handled only when it is transported from one point to another; it is the act of conveyance. The definition provides the means to determine proper controls necessary to provide safety in the transport mode. Specific handling requirements for various hazardous materials are contained in the IFC.

**HAZARDOUS MATERIALS.** Those chemicals or substances that are physical hazards or health hazards as defined and classified in this section and the *International Fire Code*, whether the materials are in usable or waste condition.

❖ The term “hazardous materials” refers to those materials that present either a physical or health hazard. A specific listing of hazardous materials is indicated in Sections 307.3, 307.4, 307.5 and 307.6. An occupancy containing greater than the maximum allowable quantity per control area of these materials as indicated in Table 307.1(1) or 307.1(2) is classified in one of the four high-hazard occupancy classifications.

**HEALTH HAZARD.** A classification of a chemical for which there is statistically significant evidence that acute or chronic health effects are capable of occurring in exposed persons. The term “health hazard” includes chemicals that are toxic or highly toxic, and corrosive.

❖ Materials that present risks to people from handling or exposure are considered health hazards. Examples of these types of materials are indicated in Section 307.6. Buildings and structures containing materials that present a health hazard in excess of the maximum allowable quantity per control area would be classified as Group H-4. Materials that present a health hazard may also present a physical hazard (see the definition



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of "Physical hazard") and must comply with the requirements of the code applicable to both hazards.

**HIGHLY TOXIC.** A material which produces a lethal dose or lethal concentration that falls within any of the following categories:

1. A chemical that has a median lethal dose ( $LD_{50}$ ) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
2. A chemical that has a median lethal dose ( $LD_{50}$ ) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kilograms each.
3. A chemical that has a median lethal concentration ( $LC_{50}$ ) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.

Mixtures of these materials with ordinary materials, such as water, might not warrant classification as highly toxic. While this system is basically simple in application, any hazard evaluation that is required for the precise categorization of this type of material shall be performed by experienced, technically competent persons.

❖ The definition is derived from DOL 29 CFR; Part 1910.1200. These materials are considered dangerous to humans when either inhaled, absorbed or injected through the skin or ingested orally. Highly toxic materials present a health hazard and are subsequently listed as Group H-4 in Section 307.6. Examples of highly toxic materials include gases such as arsine, fluorine and hydrogen cyanide, liquid acrylic acid and calcium cyanide in solid form.

Mixtures of these materials with ordinary materials, such as water, might not warrant a highly toxic classification. While this system is basically simple in application, any hazard evaluation that is required for the precise categorization of this type of material is to be performed by experienced, technically competent persons.

**INCOMPATIBLE MATERIALS.** Materials that, when mixed, have the potential to react in a manner that generates heat, fumes, gases or byproducts which are hazardous to life or property.

❖ These materials, whether in storage or in use, constitute a dangerous chemical combination. Determination of which chemicals in combination present a hazard is a difficult situation for the building official. MSDS alone may not provide all of the necessary information. When in doubt, the building official should seek additional information from the manufacturer of the chemicals involved, the building owner or from experts who are knowledgeable in industrial hygiene or chemistry.

**OPEN SYSTEM.** The use of a solid or liquid hazardous material involving a vessel or system that is continuously open to the

atmosphere during normal operations and where vapors are liberated, or the product is exposed to the atmosphere during normal operations. Examples of open systems for solids and liquids include dispensing from or into open beakers or containers, dip tank and plating tank operations.

❖ See the commentary to the definition of "Closed system."

**OPERATING BUILDING.** A building occupied in conjunction with the manufacture, transportation or use of explosive materials. Operating buildings are separated from one another with the use of intraplant or intraline distances.

❖ Buildings used for storage of explosives are not magazines. This definition is included in this section to address that fact.

**ORGANIC PEROXIDE.** An organic compound that contains the bivalent -O-O- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms have been replaced by an organic radical. Organic peroxides can pose an explosion hazard (detonation or deflagration) or they can be shock sensitive. They can also decompose into various unstable compounds over an extended period of time.

**Class I.** Those formulations that are capable of deflagration but not detonation.

**Class II.** Those formulations that burn very rapidly and that pose a moderate reactivity hazard.

**Class III.** Those formulations that burn rapidly and that pose a moderate reactivity hazard.

**Class IV.** Those formulations that burn in the same manner as ordinary combustibles and that pose a minimal reactivity hazard.

**Class V.** Those formulations that burn with less intensity than ordinary combustibles or do not sustain combustion and that pose no reactivity hazard.

**Unclassified detonable.** Organic peroxides that are capable of detonation. These peroxides pose an extremely high explosion hazard through rapid explosive decomposition.

❖ The chemical structure of organic peroxides differs from that of hydrogen peroxide (an oxidizer) in that an organic radical replaces the hydrogen atoms. Organic chemicals are all carbon based. As a result, organic peroxides pose varying degrees of fire or explosion hazard in addition to their oxidizing properties. The classification of organic peroxides is based on the provisions of NFPA 43B. Proper material classification of organic peroxides is essential to determining the appropriate occupancy classification of the structure. Examples of organic peroxides include acetyl cyclohexane, sulfonyl peroxide and benzoyl peroxide. The actual class of these materials is dependent on the percentage of concentration by weight. Most organic peroxides are available as liquids, pastes or solids in a powder form.

**OXIDIZER.** A material that readily yields oxygen or other oxidizing gas, or that readily reacts to promote or initiate com-

bustion of combustible materials. Examples of other oxidizing gases include bromine, chlorine and fluorine.

**Class 4.** An oxidizer that can undergo an explosive reaction due to contamination or exposure to thermal or physical shock. Additionally, the oxidizer will enhance the burning rate and can cause spontaneous ignition of combustibles.

**Class 3.** An oxidizer that will cause a severe increase in the burning rate of combustible materials with which it comes in contact or that will undergo vigorous self-sustained decomposition due to contamination or exposure to heat.

**Class 2.** An oxidizer that will cause a moderate increase in the burning rate or that causes spontaneous ignition of combustible materials with which it comes in contact.

**Class 1.** An oxidizer whose primary hazard is that it slightly increases the burning rate but which does not cause spontaneous ignition when it comes in contact with combustible materials.

- ❖ The classification of oxidizers is based on the provisions of NFPA 430. Oxidizers, whether a solid, liquid or gas, yield oxygen or another oxidizing gas during a chemical reaction or readily react to oxidize combustibles. The rate of reaction varies with the class of oxidizer. Specific classification of oxidizers is important because of the varying degree of hazard. Example of oxidizers include liquid hydrogen peroxide, nitric acid, sulfuric acid and solids such as sodium chlorite, chromic acid and calcium hypochlorite. Many commercially available swimming pool chemicals are indicative of Class 2 or 3 oxidizers.

**OXIDIZING GAS.** A gas that can support and accelerate combustion of other materials.

- ❖ Oxidizers sometimes yield oxidizing gases during a chemical reaction. These gases are capable of supporting and accelerating the combustion of other materials. Examples of oxidizing gases include bromine, chlorine and fluorine.

**PHYSICAL HAZARD.** A chemical for which there is evidence that it is a combustible liquid, compressed gas, cryogenic, explosive, flammable gas, flammable liquid, flammable solid, organic peroxide, oxidizer, pyrophoric or unstable (reactive) or water-reactive material.

- ❖ Those materials that present a detonation hazard, deflagration hazard or readily support combustion are considered physical hazards. Examples of the types of materials that present a physical hazard are included in the definition. Buildings and structures containing materials that present a physical hazard in excess of the maximum allowable quantity per control area would be classified in Group H-1, H-2 or H-3. Materials that present a physical hazard may also present a health hazard (see the definition of "Health hazard").

**PYROPHORIC.** A chemical with an autoignition temperature in air, at or below a temperature of 130°F (54.4°C).

- ❖ The definition is derived from DOL 29 CFR; Part 1910.1200. Pyrophoric materials, whether in a gas, liquid or solid form, are capable of spontaneous igni-

tion at low temperatures. Examples of pyrophoric materials include silane and phosphine gas; liquid diethylaluminum chloride and inert solids, such as cesium, plutonium, potassium and robidium.

**PYROTECHNIC COMPOSITION.** A chemical mixture that produces visible light displays or sounds through a self-propagating, heat-releasing chemical reaction which is initiated by ignition.

- ❖ Pyrotechnic composition consists of those chemical components, including oxidizers, that cause fireworks to make noise or display light when ignited. The definition is derived from NFPA 1124. The amount of pyrotechnic composition is the determining factor in whether the storage area for consumer fireworks is classified as Group H-3. The pyrotechnic content of consumer fireworks is contained within a significant amount of packaging and nonexplosive materials used in their manufacture, which constitute the bulk of the weight of the fireworks devices.

**TOXIC.** A chemical falling within any of the following categories:

1. A chemical that has a median lethal dose (LD<sub>50</sub>) of more than 50 milligrams per kilogram, but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
2. A chemical that has a median lethal dose (LD<sub>50</sub>) of more than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kilograms each.
3. A chemical that has a median lethal concentration (LC<sub>50</sub>) in air of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than 2 milligrams per liter but not more than 20 milligrams per liter of mist, fume or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.

- ❖ The definition is derived from DOL 29 CFR; Part 1910.1200. These materials are considered dangerous to humans when either inhaled, absorbed or injected through the skin or when orally ingested. Toxic materials differ from highly toxic materials with regard to the specified median lethal dose or concentration of a given chemical. Toxic materials present a health hazard and are subsequently listed as a Group H-4 material in Section 307.6. Examples of toxic materials include gases such as chlorine; phosgene and hydrogen fluoride; liquid alkyl alcohol; methyl isocyanide and phosphorous chloride and barium chloride, benzidine and sodium fluoride in solid form.

**UNSTABLE (REACTIVE) MATERIAL.** A material, other than an explosive, which in the pure state or as commercially produced, will vigorously polymerize, decompose, condense or become self-reactive and undergo other violent chemical

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changes, including explosion, when exposed to heat, friction or shock, or in the absence of an inhibitor, or in the presence of contaminants, or in contact with incompatible materials. Unstable (reactive) materials are subdivided as follows:

**Class 4.** Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures. This class includes materials that are sensitive to mechanical or localized thermal shock at normal temperatures and pressures.

**Class 3.** Materials that in themselves are capable of detonation or of explosive decomposition or explosive reaction but which require a strong initiating source or which must be heated under confinement before initiation. This class includes materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures.

**Class 2.** Materials that in themselves are normally unstable and readily undergo violent chemical change but do not detonate. This class includes materials that can undergo chemical change with rapid release of energy at normal temperatures and pressures, and that can undergo violent chemical change at elevated temperatures and pressures.

**Class 1.** Materials that in themselves are normally stable but which can become unstable at elevated temperatures and pressure.

❖ The classification of unstable (reactive) materials is based on provisions in NFPA 704. The different classes of unstable (reactive) materials reflect the degree of susceptibility of the materials to release energy. Unstable (reactive) materials polymerize, decompose or become self-reactive when exposed to heat, air, moisture, pressure or shock. Separation from incompatible materials is essential to minimizing the hazards. Examples of unstable (reactive) materials include nitromethane, perchloric acid, sodium perchlorate, vinyl acetate and acetic acid.

**WATER-REACTIVE MATERIAL.** A material that explodes; violently reacts; produces flammable, toxic or other hazardous gases; or evolves enough heat to cause autoignition or ignition of combustibles upon exposure to water or moisture. Water-reactive materials are subdivided as follows:

**Class 3.** Materials that react explosively with water without requiring heat or confinement.

**Class 2.** Materials that react violently with water or have the ability to boil water. Materials that produce flammable, toxic or other hazardous gases or evolve enough heat to cause autoignition or ignition of combustibles upon exposure to water or moisture.

**Class 1.** Materials that react with water with some release of energy, but not violently.

❖ These materials liberate significant quantities of heat when reacting with water. Combustible water-reactive materials are capable of self-ignition. Even noncombustible water-reactive materials present a hazard because of the heat liberated during their reaction with water, which is sufficient to ignite surrounding combustible materials. While a definition for Class 1

water-reactive materials is provided for informational purposes, the maximum allowable quantity per control area of these materials in accordance with Table 307.1(1) is not limited. The descriptions of each of the subdivisions is consistent with the approach used for the determination of water hazards in NFPA 704.

**[F] 307.3 High-hazard Group H-1.** Buildings and structures containing materials that pose a detonation hazard shall be classified as Group H-1. Such materials shall include, but not be limited to, the following:

Explosives:

Division 1.1

Division 1.2

Division 1.3

**Exception:** Materials that are used and maintained in a form where either confinement or configuration will not elevate the hazard from a mass fire to mass explosion hazard shall be allowed in H-2 occupancies.

Division 1.4

**Exception:** Articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco and Firearms regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles shall be allowed in H-3 occupancies.

Division 1.5

Division 1.6

Organic peroxides, unclassified detonable

Oxidizers, Class 4

Unstable (reactive) materials, Class 3 detonable and Class 4

Detonable pyrophoric materials

❖ The contents of occupancies in Group H-1 present a detonation hazard. Examples of materials that create this hazard are listed in the section. The definitions for Group H-1 materials are contained in Section 307.2. Because of the explosion hazard potential associated with Group H-1 materials, occupancies in Group H-1, which exceed the maximum allowable quantity per control area indicated in Table 307.1(1), are required to be located in detached one-story buildings without basements (see commentary, Sections 415.4 and 508.3).

**[F] 307.4 High-hazard Group H-2.** Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or combustible liquids which are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 psi (103.4 kPa) gage.

Combustible dusts

Cryogenic fluids, flammable

Flammable gases

Organic peroxides, Class I



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Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 psi (103 kPa) gage  
 Pyrophoric liquids, solids and gases, nondetonable  
 Unstable (reactive) materials, Class 3, nondetonable  
 Water-reactive materials, Class 3

- ❖ The contents of occupancies in Group H-2 present a deflagration or accelerated burning hazard. Examples of materials that create this hazard are listed. The definitions for Group H-2 materials are contained in Section 307.2. Because of the severe fire or reactivity hazard associated with these types of materials, proper classification is essential in determining the applicable requirements with regard to the mitigation of these hazards.

**[F] 307.5 High-hazard Group H-3.** Buildings and structures containing materials that readily support combustion or that pose a physical hazard shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or combustible liquids that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less  
 Combustible fibers, other than densely packed baled cotton  
 Consumer fireworks, 1.4G (Class C, Common)  
 Cryogenic fluids, oxidizing  
 Flammable solids  
 Organic peroxides, Class II and III  
 Oxidizers, Class 2  
 Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less  
 Oxidizing gases  
 Unstable (reactive) materials, Class 2  
 Water-reactive materials, Class 2

- ❖ The contents of occupancies in Group H-3 present a hazard inasmuch as they contain materials that readily support combustion or that present a physical hazard. Examples of materials that create this hazard are listed. The definitions for Group H-3 materials are contained in Section 307.2. While Group H-3 materials are generally less of a fire or reactivity hazard than Group H-2 materials, they still present a greater physical hazard than materials not currently regulated as high hazard.

**[F] 307.6 High-hazard Group H-4.** Buildings and structures which contain materials that are health hazards shall be classified as Group H-4. Such materials shall include, but not be limited to, the following:

Corrosives  
 Highly toxic materials  
 Toxic materials

- ❖ The contents of occupancies in Group H-4 present a hazard inasmuch as they contain materials that are health hazards. Examples of these hazards are listed in this section. The definitions for Group H-4 materials are contained in Section 307.2. While reference is

made to chemicals that cause these hazards, the data sheets for these chemicals, which are furnished by the applicant, will need considerable subjective evaluation. Some materials falling into the category of health hazard may also present a physical hazard and would, therefore, require the structure to be designed for multiple hazards in accordance with Section 307.8.

**[F] 307.7 High-hazard Group H-5 structures.** Semiconductor fabrication facilities and comparable research and development areas in which hazardous production materials (HPM) are used and the aggregate quantity of materials is in excess of those listed in Tables 307.1(1) and 307.1(2) shall be classified as Group H-5. Such facilities and areas shall be designed and constructed in accordance with Section 415.8.

- ❖ HPM includes flammable liquids and gases, corrosives, oxidizers and, in many instances, highly toxic materials (see the definition for "Hazardous production material" in Section 415.2). In determining the applicable requirements of other sections of the code, HPM facilities are considered to be Group H-5 occupancies. The provisions of Sections 307 and 506.3 as well as Table 1005.1, however, are not intended to be applicable based on a high-hazard occupancy classification. It is intended that the quantities of materials permitted in Table 415.8.2.1.1 will take precedence over Tables 307.1(1) and 307.1(2).

**[F] 307.8 Multiple hazards.** Buildings and structures containing a material or materials representing hazards that are classified in one or more of Groups H-1, H-2, H-3 and H-4 shall conform to the code requirements for each of the occupancies so classified.

- ❖ If materials are present that possess characteristics of more than one high-hazard occupancy, then the structure must be designed to protect against the hazards of each relevant high-hazard occupancy classification. For example, a material could be classified as both a Class 2 oxidizer (Group H-3) and a corrosive (Group H-4). If the given quantity exceeded the maximum allowable quantity per control area individually for both a Class 2 oxidizer and a corrosive, the structure is required to conform to the applicable requirements of both Groups H-3 and H-4.

## SECTION 308 INSTITUTIONAL GROUP I

**308.1 Institutional Group I.** Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which people are cared for or live in a supervised environment, having physical limitations because of health or age are harbored for medical treatment or other care or treatment, or in which people are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

- ❖ Institutional occupancies are comprised of two basic types. The first relates to health care facilities that are intended to provide medical care or treatment for peo-



ple who have physical or mental disabilities or diseases and other infirmities. This includes persons who are ambulatory and capable of self-preservation as well as those who are restricted in their mobility or totally immobile and need assistance to escape a life-threatening situation, such as a fire (i.e., children 2½ years of age or less, the infirm and the aged). The second type of occupancy relates primarily to detention and correctional facilities. Since security is the major operational consideration in these kinds of facilities, the occupants (inmates) are under some form of restraint and may be rendered incapable of self-preservation without assistance in emergency situations.

The degree of hazards in each type of institutional facility identified in this section varies respective to each kind of occupancy. The code addresses each occupancy separately and the regulatory provisions throughout the code provide the proper means of protection so as to produce an acceptable level of safety to life and property.

This section identifies the occupancies that are included in the general term "Group I." Institutional occupancies are divided into four individual occupancy classifications: Groups I-1, I-2, I-3 and I-4. These classifications are based on the degree of detention and physical mobility of the occupants. The term "Group I" includes each of the individual institutional occupancy classifications.

**308.2 Group I-1.** This occupancy shall include buildings, structures or parts thereof housing more than 16 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

- Residential board and care facilities
- Assisted living facilities
- Halfway houses
- Group homes
- Congregate care facilities
- Social rehabilitation facilities
- Alcohol and drug centers
- Convalescent facilities

A facility such as the above with five or fewer persons shall be classified as a Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2. A facility such as above, housing at least six and not more than 16 persons, shall be classified as Group R-4.

❖ An occupancy classified in Group I-1 is characterized by four conditions: it is a health care facility, the occupant load is greater than 16 (in order to be consistent with the definition of "Residential care/assisted living facility"), there is 24-hour-a-day supervision and the occupants are capable of reaching safety in an emergency situation without the need of physical assistance by staff or others. The supervision for Group I-1 buildings is for counseling and assistance purposes, not for medical purposes.

Any building that has these characteristics but that contains an occupant load of more than five and not more than 16 is classified as Group R-4 (see Section 310.1). Any building that has these characteristics but contains an occupant load of five or less is classified as Group R-3 (see Section 310.1), or shall be constructed in accordance with the *International Residential Code*® (IRC®). The occupant load for occupancy classification purposes refers to the number of residents only. The number of guests or staff are not included. Please note, however, that the number of guests and staff are included for means of egress purposes.

For clarification purposes, a dormitory or apartment complex that houses only elderly people and has a nonmedically trained live-in manager is not classified as an institutional occupancy but rather as a residential occupancy (see Section 310.1). A critical phrase in the code to consider when evaluating this type of facility is "live in a supervised residential environment".

**308.3 Group I-2.** This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing or custodial care on a 24-hour basis for more than five persons who are not capable of self-preservation. This group shall include, but not be limited to, the following:

- Hospitals
- Nursing homes (both intermediate care facilities and skilled nursing facilities)
- Mental hospitals
- Detoxification facilities

A facility such as the above with five or fewer persons shall be classified as Group R-3 or shall comply with the *International Residential Code*.

❖ An occupancy classified in Group I-2 is characterized by four conditions: it is a health care facility, the occupant load is greater than five, there is 24-hour-a-day medical supervision and there are occupants who are incapable of self-preservation (i.e., some or all of the occupants require physical assistance by staff or others to reach safety in an emergency situation).

As with Group I-1, any building that has these characteristics but that contains an occupant load of five or less is classified as a residential occupancy, Group R-3 (see Section 310.1), or shall be constructed in accordance with the IRC.

The most common examples of facilities classified in Group I-2 are hospitals and nursing homes [see Figures 308.3(1) and 308.3(2)].

It is not uncommon to find dining rooms (Group A-2), staff offices (Group B), gift shops (Group M) and other nonmedically related areas in buildings classified as Group I-2. Unless the area of the nonmedical occupancy qualifies as an accessory occupancy (see Section 508.3.1), the building is considered as a mixed occupancy and subject to the provisions of Section 508.3. In addition to the general requirements contained in this section, Section 407 contains specific requirements for Group I-2.

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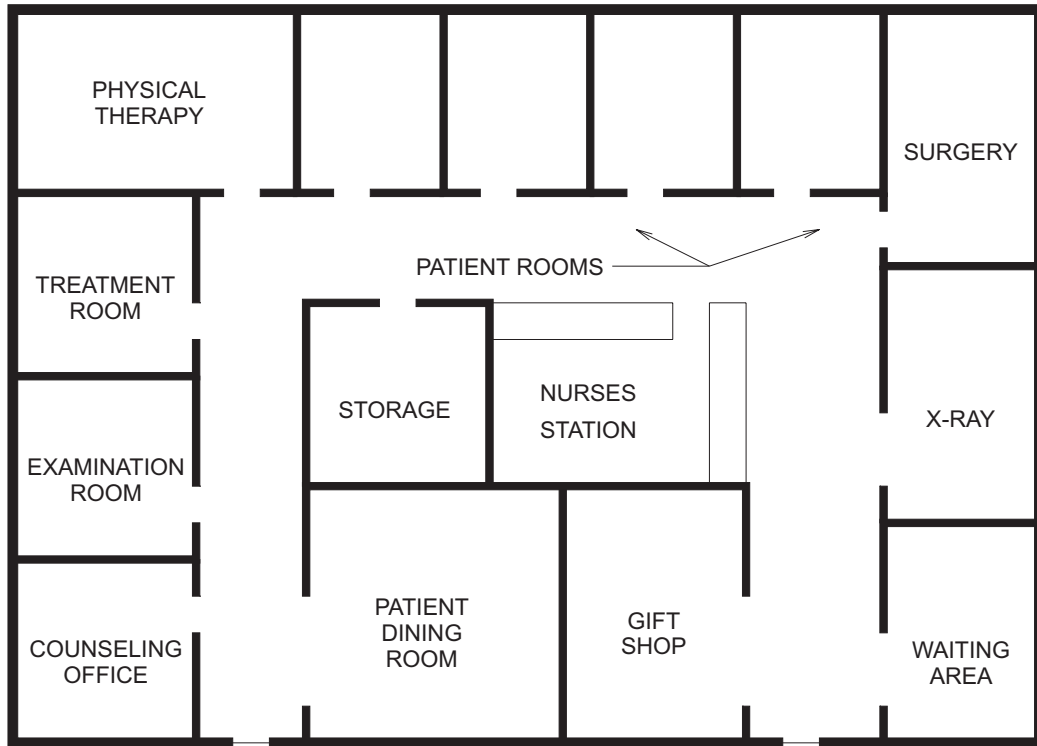


Figure 308.3(1)  
GROUP I-2—HOSPITAL

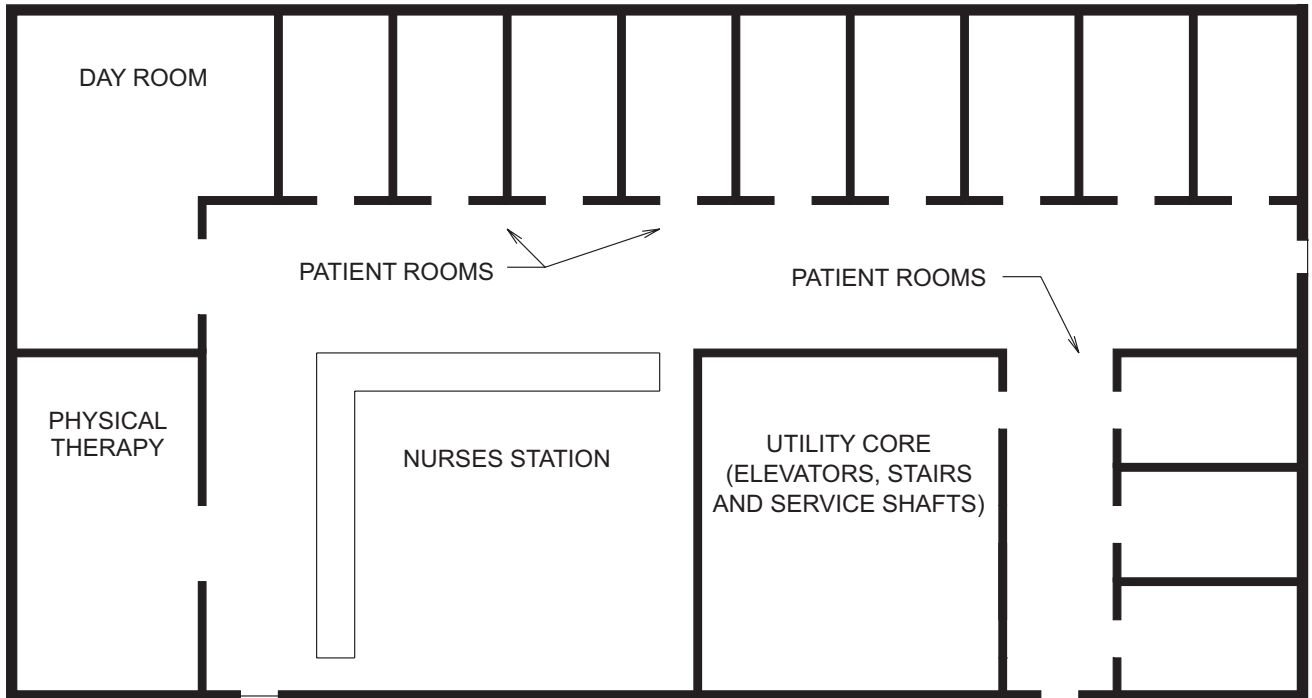


Figure 308.3(2)  
GROUP I-2—NURSING HOME

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**308.3.1 Child care facility.** A child care facility that provides care on a 24-hour basis to more than five children 2½ years of age or less shall be classified as Group I-2.

❖ Child care facilities housing more than five children 2½ years old and younger on a 24-hour basis are classified as Group I-2 because children that age are not generally capable of responding to an emergency and must be led or carried to safety. Under such circumstances, the occupants are considered nonambulatory. The distinguishing factor between Groups I-2 and I-4 is the amount of time the facility provides care; Group I-2 facilities provide care on a 24-hour basis, while Group I-4 facilities must be less than 24 hours. It is also assumed that medical supervision is present in Group I-2 facilities. Figure 308.3.1 summarizes the different occupancy classifications for care facilities.

**308.4 Group I-3.** This occupancy shall include buildings and structures that are inhabited by more than five persons who are under restraint or security. An I-3 facility is occupied by persons who are generally incapable of self-preservation due to security measures not under the occupants' control. This group shall include, but not be limited to, the following:

- Prisons
- Jails
- Reformatories
- Detention centers
- Correctional centers
- Prerelease centers

Buildings of Group I-3 shall be classified as one of the occupancy conditions indicated in Sections 308.4.1 through 308.4.5 (see Section 408.1).

❖ An occupancy classified in Group I-3 is characterized by three conditions: it is a location where the occupants are under restraint or where security is closely

supervised, there are more than five occupants and the occupants are not capable of self-preservation because the conditions of confinement are not under their control (i.e., they require assistance by the facilities' staff to reach safety in an emergency situation). The occupant load for occupancy classification purposes refers to the number of residents only. The number of guests or staff are not included. Please note, however, that the number of guests and staff are included for means of egress purposes.

Buildings that have these characteristics but that contain an occupant load of five or less are classified as a residential occupancy, but are still subject to special hardware requirements (see Chapter 10).

It is recognized that not all Group I-3 occupancies exercise the same level of restraint; thus, to distinguish these different levels, the code defines five different conditions of occupancy based on the degree of access to the exit discharge.

The five occupancy conditions are summarized in Figure 308.4.

**308.4.1 Condition 1.** This occupancy condition shall include buildings in which free movement is allowed from sleeping areas, and other spaces where access or occupancy is permitted, to the exterior via means of egress without restraint. A Condition 1 facility is permitted to be constructed as Group R.

❖ Condition 1 areas are those where the occupants have unrestrained access to the exterior of the building. As such, a key or remote control release device is not needed for any occupant to reach the exterior of the building (exit discharge) at any time. These types of buildings are referred to as low-security facilities. A work-release center is a typical Condition 1 facility (see Figure 308.4.1).

Because of the lack of restraint associated with a

24-HOUR CARE			
Age and capability of residents	1-5 occupants	6-16 occupants	Over 16 occupants
2½ years of age or less	R-3	I-2	I-2
Over 2½ years of age and capable of self-preservation	R-3	R-4	I-1
Over 2½ years of age and not capable of self-preservation	R-3	I-2	I-2
LESS THAN 24-HOUR CARE—DAY CARE			
Age and capability of residents	1-5 occupants	Over 5 occupants	
2½ years of age or less	R-3	I-4 (Exception permits E)	
Over 2½ years of age through 12th grade and capable of self-preservation	R-3	E	
Over 12th grade and capable of self-preservation	R-3	A-3	
Over 2½ years of age and not capable of self-preservation	R-3	I-4	

**Figure 308.3.1  
OCCUPANCY CLASSIFICATION OF CARE FACILITIES**

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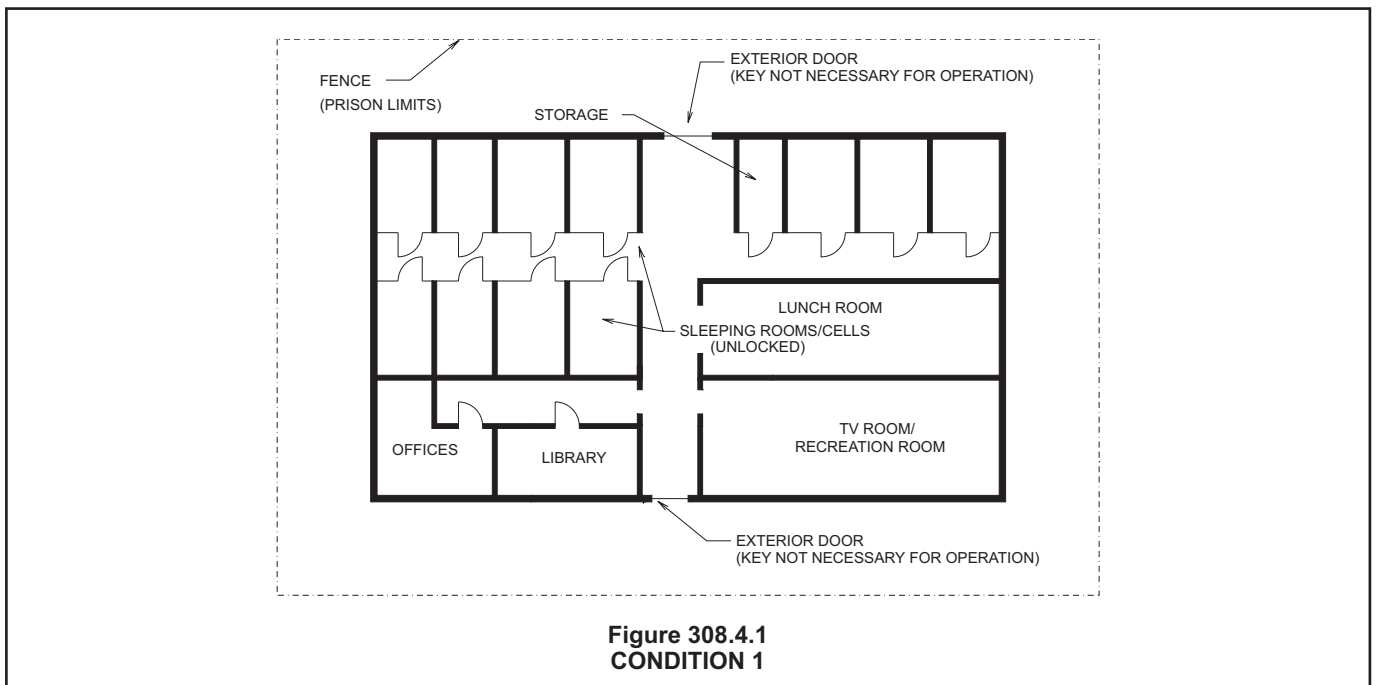
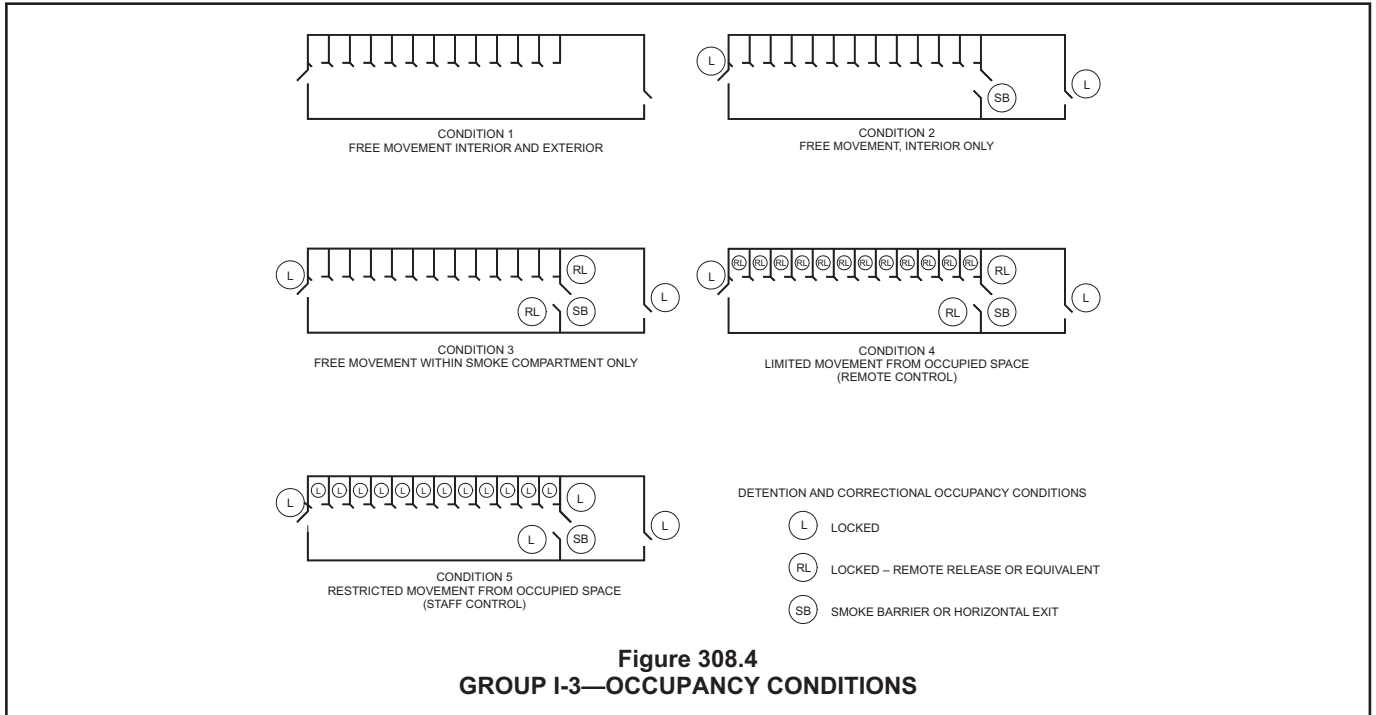
Condition 1 building, it resembles a residential use more than a detention facility and, therefore, is permitted to be classified in Group R (see Section 310).

**308.4.2 Condition 2.** This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and any other occupied smoke compartment to one or more other smoke compartments. Egress to the exterior is impeded by locked exits.

❖ Condition 2 areas are those in which the movement of occupants is not controlled within the exterior walls of

the building (i.e., the occupants have unrestrained access within the building). As such, there is free movement by the occupants between smoke compartments (as created by smoke barriers); however, the occupants must rely on someone else to allow them to exit the building to the area of discharge. This is illustrated in Figure 308.4.2.

**308.4.3 Condition 3.** This occupancy condition shall include buildings in which free movement is allowed within individual smoke compartments, such as within a residential unit com-





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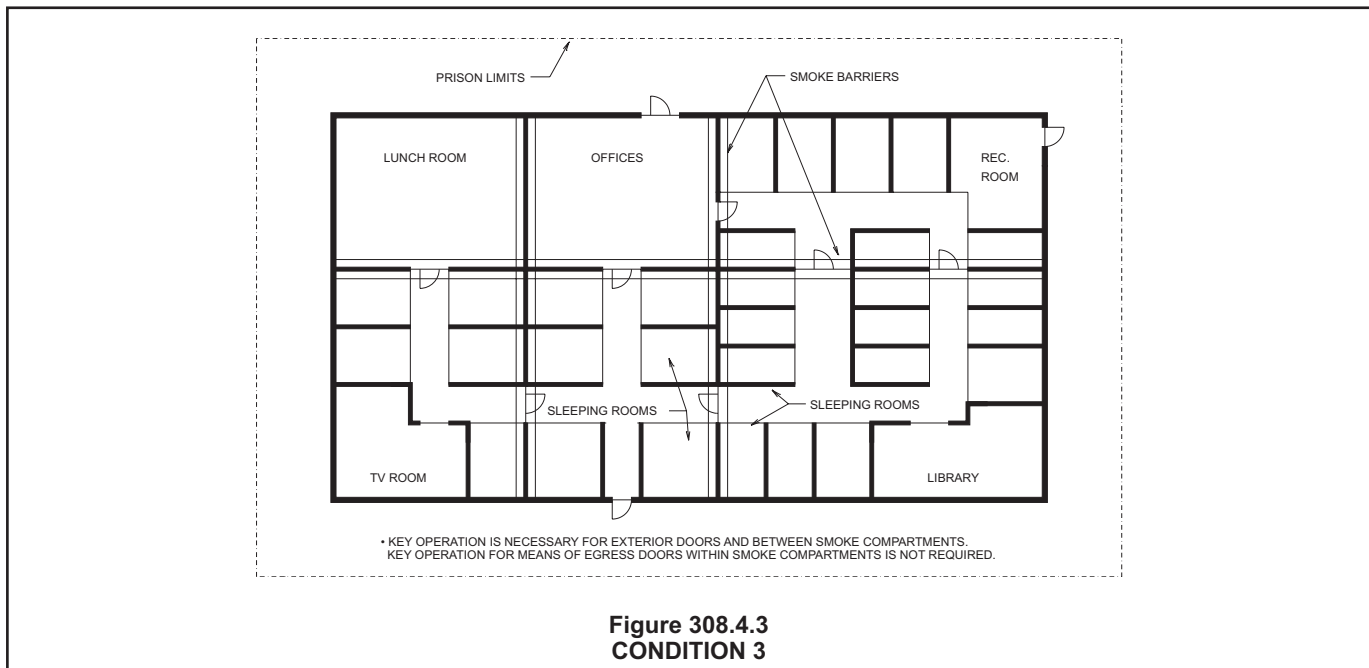
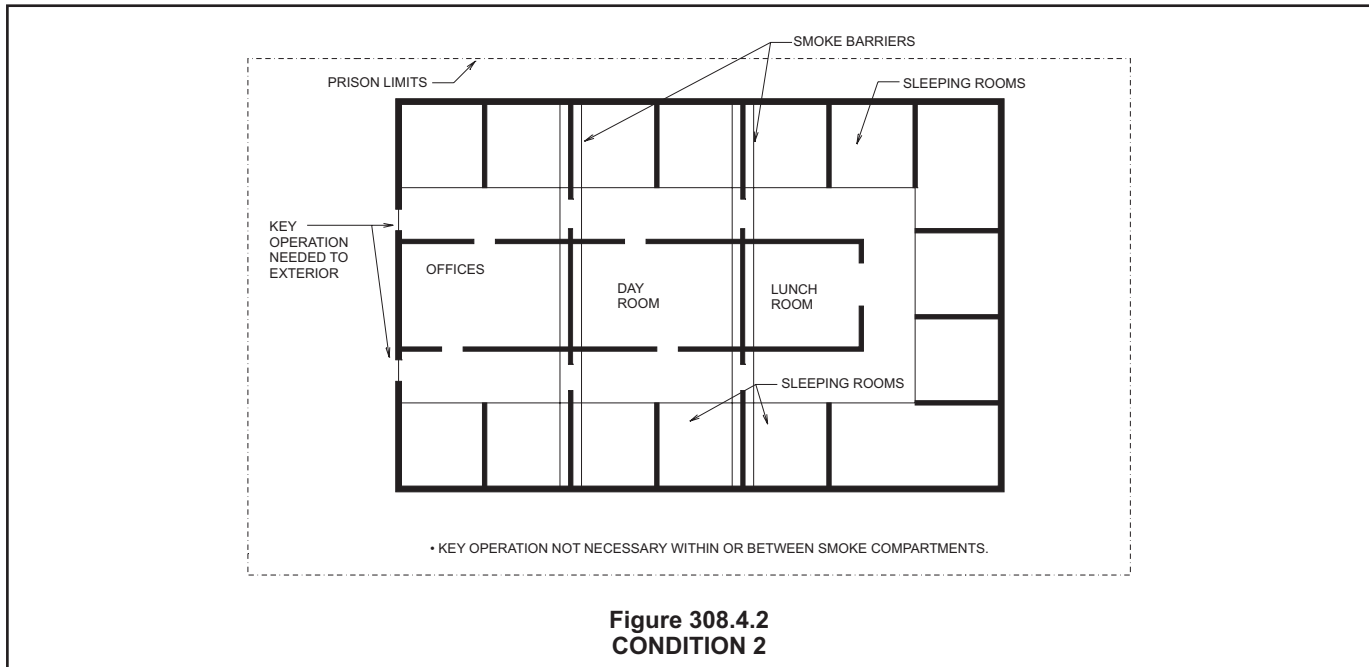
prised of individual sleeping units and group activity spaces, where egress is impeded by remote-controlled release of means of egress from such a smoke compartment to another smoke compartment.

❖ Condition 3 areas are those in which free movement by the occupants is permitted within an individual smoke compartment; however, movement of occupants from one smoke compartment (as created by smoke barriers) to another smoke compartment and from within the building to the exterior (exit discharge) is controlled by remote release locking devices. As such, the occupants in the facility are dependent on the staff for their release from each smoke compart-

ment or to the exterior (exit discharge). This condition is illustrated in Figure 308.4.3.

**308.4.4 Condition 4.** This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Remote-controlled release is provided to permit movement from sleeping units, activity spaces and other occupied areas within the smoke compartment to other smoke compartments.

❖ Condition 4 areas are those in which the movement of occupants from any room or space within a smoke compartment (as created by smoke barriers) to another smoke compartment or to the exterior (exit dis-



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charge) is controlled by remote release locking devices. Any movement within the facility requires activation of a remote control lock system to release the designated area (see Figure 308.4.4). The occupants within a Condition 4 area must rely on an activation system in the event of an emergency in order to evacuate the area.

Condition 4 facilities most often are penal facilities where the occupants are considered relatively safe to handle in large groups. As such, many occupants can be released simultaneously from their individual sleeping areas when they need to travel to dining areas or move to another area.

**308.4.5 Condition 5.** This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Staff-controlled manual release is provided to permit movement from sleeping units, activity spaces and other occupied areas within the smoke compartment to other smoke compartments.

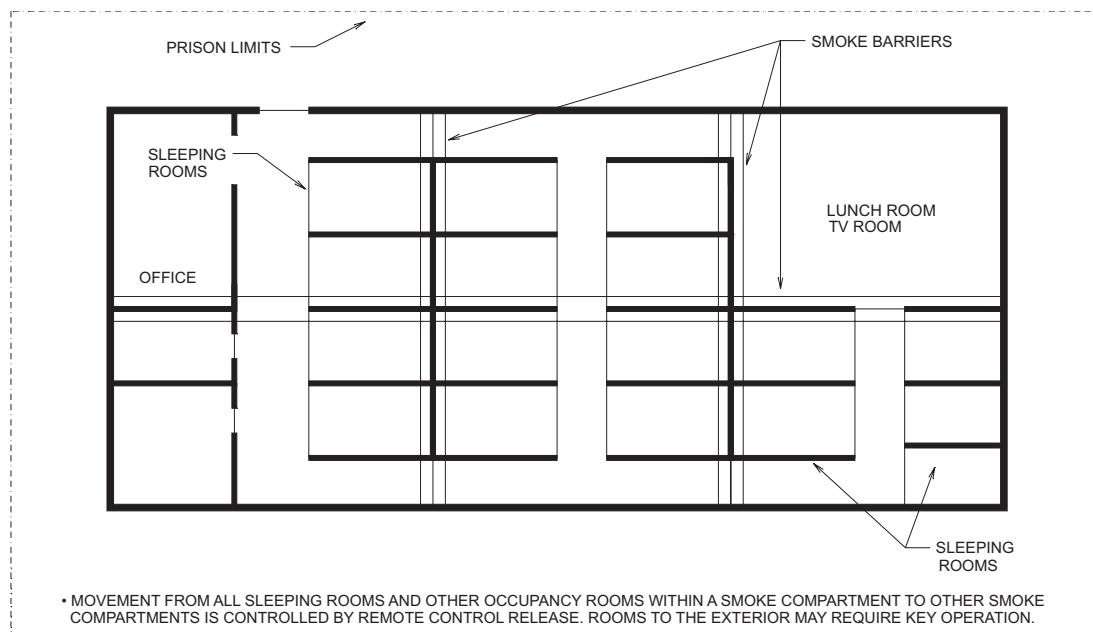
- ❖ Condition 5 areas are those in which the occupants are not allowed free movement to any other room or space within a smoke compartment (as created by smoke barriers) to another smoke compartment or to the exterior (exit discharge) unless the locking device controlling their area of confinement is manually released by a staff member. Once released from an individual space, a staff member is responsible for unlocking all doors from that location to the next smoke compartment. This is the most restrictive occupancy condition, as each occupant must be released on an individual basis and escorted to other areas.

Condition 5 facilities are most often used for maximum security or solitary confinement areas where the

occupants are considered to be dangerous to others, including staff members, and cannot safely be handled in large groups (see Figure 308.4.5).

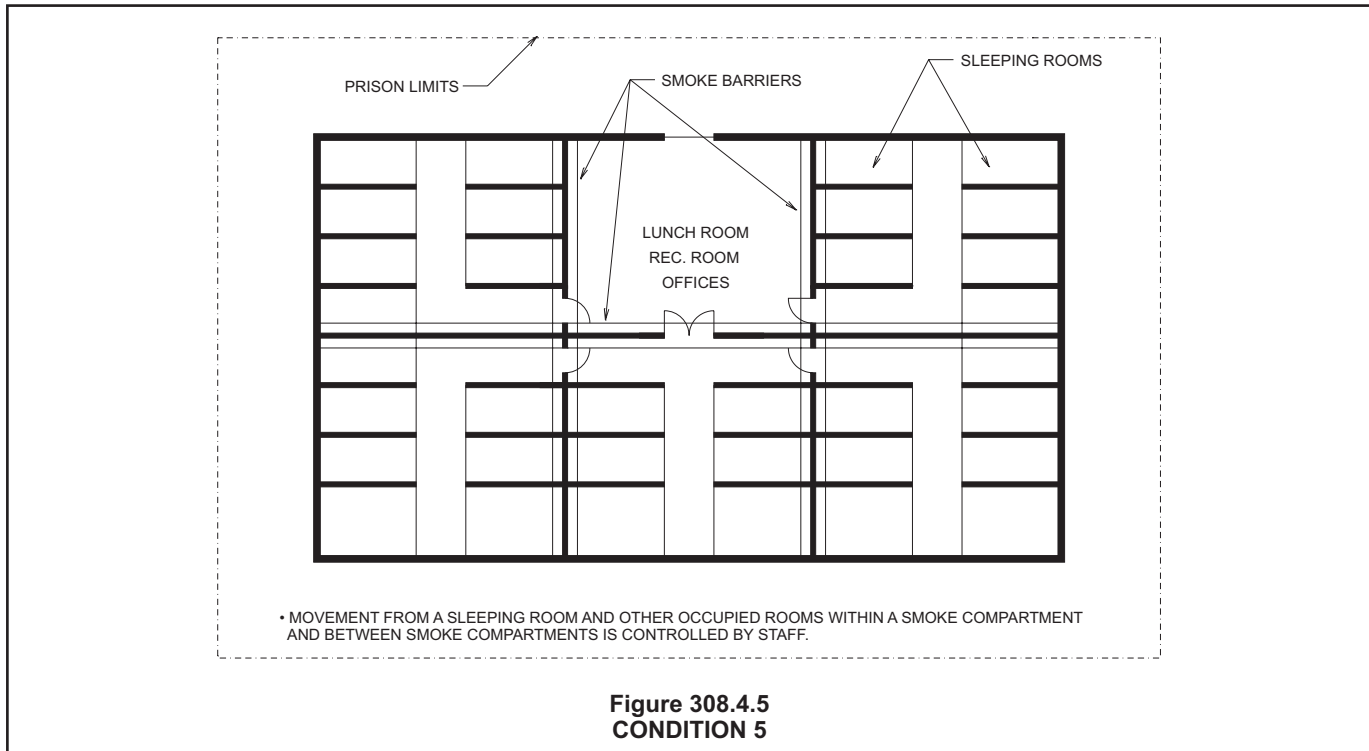
**308.5 Group I-4, day care facilities.** This group shall include buildings and structures occupied by persons of any age who receive custodial care for less than 24 hours by individuals other than parents or guardians, relatives by blood, marriage or adoption, and in a place other than the home of the person cared for. A facility such as the above with five or fewer persons shall be classified as a Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2. Places of worship during religious functions are not included.

- ❖ Facilities that contain provisions for the care of more than five adults (older than the 12th grade) or more than five children 2½ years of age or less are classified as Group I-4. Group I-4 facilities are less restrictive in some of the requirements (e.g., height and area) than the other Group I occupancies. Group I-4 facilities are intended to be used for less than 24 hours and are not intended to provide medical supervision. Day care facilities are not intended to be a residence for the people receiving care. The staff members are assumed to not be related to the individuals in the day care facilities. In order to be consistent with the other Group I facilities, buildings that have five or less occupants are to be classified as Group R-3, or shall be constructed in accordance with the IRC. The definition for Group I-4 facilities could be construed to include places of worship; therefore, the last sentence of Section 308.5 clarifies that Group I-4 provisions would not apply to places of worship unless the space is also used for day care facilities.



**Figure 308.4.4**  
**CONDITION 4**

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**308.5.1 Adult care facility.** A facility that provides accommodations for less than 24 hours for more than five unrelated adults and provides supervision and personal care services shall be classified as Group I-4.

**Exception:** A facility where occupants are capable of responding to an emergency situation without physical assistance from the staff shall be classified as Group A-3.

❖ Adult care facilities are assumed to be for people beyond the 12th grade that require some type of personal care (i.e., nonmedical). For people up to and including the 12th grade, the building must be classified as Group I-2 (occupants are 2½ years of age or less) or as Group E (occupants greater than 2½ years of age but below 12th grade). In addition, there must be more than five adults in the facility and they must not be related in any manner. Facilities in which the adults are related would be more appropriately classified in Group R. The exception clarifies that the classification of Group I-4 for an adult day care facility does not apply to facilities that provide services for adults who are capable of responding to an emergency unassisted. In that case, the facility is simply a place of assembly, or a Group A-3 occupancy.

**308.5.2 Child care facility.** A facility that provides supervision and personal care on less than a 24-hour basis for more than five children 2½ years of age or less shall be classified as Group I-4.

**Exception:** A child day care facility that provides care for more than five but no more than 100 children 2½ years or

less of age, when the rooms where such children are cared for are located on the level of exit discharge and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.

❖ As with Group I-2 child care facilities, the occupants of Group I-4 child care facilities are limited to 2½ years of age or less. The distinguishing factor between the two occupancies is the amount of time the facility provides care; Group I-2 facilities provide care on a 24-hour basis while Group I-4 facilities must be less than 24 hours. It is also assumed that medical supervision is not present in Group I-4 facilities. Occupants 2½ years of age or less are not typically capable of independently responding to an emergency and must be led or carried to safety. Under such circumstances, the occupants are considered nonambulatory.

A child care facility in which the number of occupants is greater than five but not more than 100 is permitted to be classified as Group E, provided the children are all located in rooms on the level of exit discharge and all of the rooms have exit doors directly to the exterior. This exception is only applicable to rooms and spaces used for child care and is not intended to apply to accessory spaces such as restrooms, offices and kitchens.

By permitting the facility to be classified as Group E, the building would not be required to be sprinklered unless the fire area was greater than 20,000 square feet (1858 m²). A Group I-4 facility would be required to be sprinklered regardless of the area.

## SECTION 309 MERCANTILE GROUP M

**309.1 Mercantile Group M.** Mercantile Group M occupancy includes, among others, buildings and structures or a portion thereof, for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public. Mercantile occupancies shall include, but not be limited to, the following:

- Department stores
- Drug stores
- Markets
- Motor fuel-dispensing facilities
- Retail or wholesale stores
- Sales rooms

❖ The characteristics of occupancies classified in Group M are contained in this section. Because mercantile occupancies normally involve the display and sale of large quantities of combustible merchandise, the fuel load in such facilities can be relatively high, potentially exposing the occupants (customers and sales personnel) to a high degree of fire hazard. Mercantile operations often attract large crowds (particularly in large department stores and covered malls and especially during weekends and holidays). There are two factors that alleviate the risks to life safety: the occupant load normally has a low-to-moderate density and the occupants are alert, mobile and able to respond in an emergency situation. The degree of openness and the organization of the retail display found in most mercantile occupancies is generally orderly and does not present an unusual difficulty for occupant evacuation.

Contained herein are general descriptions of the

kinds of occupancies that are classified in Group M. Mercantile buildings most often have both a moderate occupant load and a high fuel load, which is in the form of furnishings and the goods being displayed, stored and sold [see Figure 309.1(1)].

The key characteristics that differentiate occupancies classified in Group M from those classified in Group B (see Section 304) are the larger quantity of goods or merchandise available for sale and the lack of familiarity of the occupants with the building, particularly its means of egress. To be classified in Group M, the goods that are on display must be accessible to the public. If a patron sees an item for sale, then that item is generally available for purchase at that time (i.e., there is a large stock of goods). If a store allows people to see the merchandise but it is not available on the premises, such as an automobile showroom, then the occupancy classification of business (Group B) should be considered. A mercantile building is accessible to the public, many of whom may not be regular visitors. A business building, however, is primarily occupied by regular employees who are familiar with the building arrangement and, most importantly, the exits. This awareness of the building and the exits can be an important factor in a fire emergency.

Automotive, fleet-vehicle, marine and self-service fuel-dispensing facilities, as defined in the IFC, are classified in the mercantile occupancy, as are the convenience stores often associated with such occupancies [(see Figure 309.1(2)). Quick-lube, tune-up, muffler and tire shops are not included in this classification. Those facilities that typically conduct automotive service and repair work are treated as a repair garage (Group S-1, also defined in the IFC).

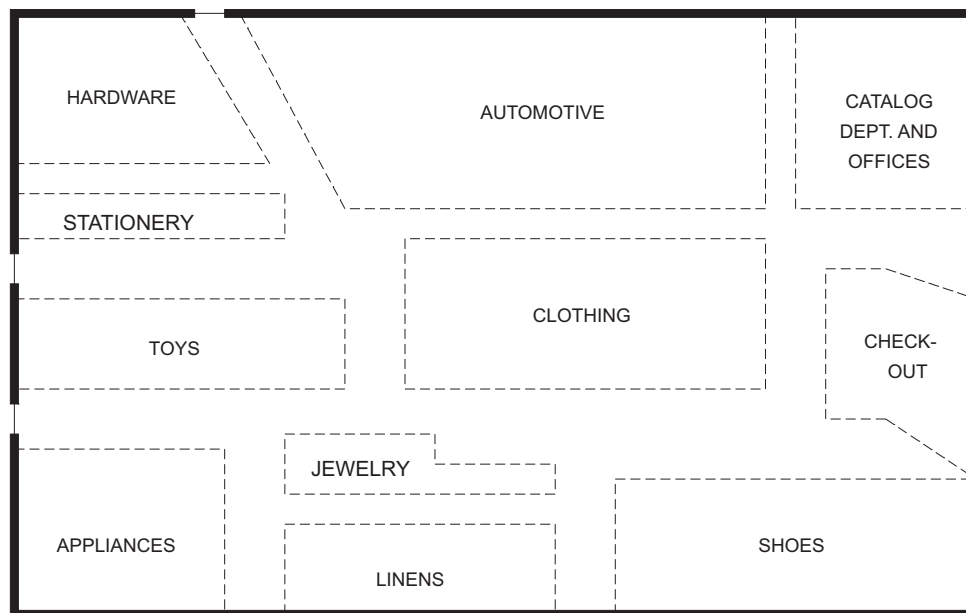


Figure 309.1(1)  
GROUP M—DEPARTMENT STORE



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**309.2 Quantity of hazardous materials.** The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored or displayed in a single control area of a Group M occupancy shall not exceed the quantities in Table 414.2.5(1).

❖ This section addresses an exception for control areas of mercantile occupancies containing certain nonflammable or noncombustible materials and health hazard gases that are stored in accordance with Table 414.2.5(1). This section allows Group H-4 materials, which present a health hazard rather than a physical hazard, as well as limited Group H-2 and H-3 materials, to be stored in both the retail display and stock areas of regulated mercantile occupancies in excess of the maximum allowable quantity per control area of Tables 307.1(1) and 307.1(2) without classifying the building as Group H. To correctly classify a building where products that have hazardous properties are stored and sold, the code user must also be aware of the provisions contained in Section 307.1, Notes b and c of Table 307.1(1) and Note b of Table 307.1(2). These provisions give the quantity limitations for specific high-hazard products in mercantile display areas, including medicines, foodstuffs, cosmetics and alcoholic beverages.

Without this option, many mercantile occupancies could technically be classified as Group H. The increased quantities of certain hazardous materials are based on the recognition that, while there is limited risk in mercantile occupancies, the packaging and storage arrangements can be controlled. For further information on the storage limitations required for these types

of materials in mercantile occupancies, see Section 2703.11 of the IFC.

**SECTION 310  
RESIDENTIAL GROUP R**

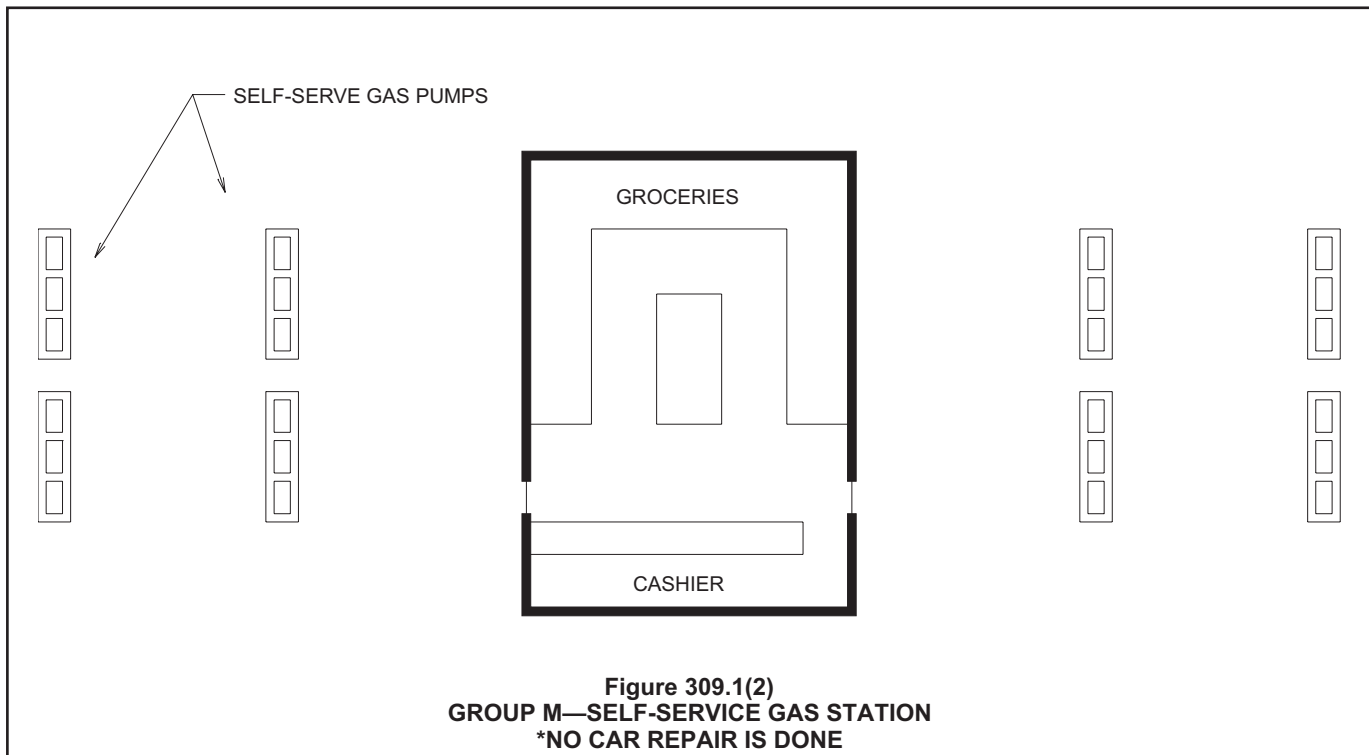
**310.1 Residential Group R.** Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2. Residential occupancies shall include the following:

**R-1** Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

- Boarding houses (transient)
- Hotels (transient)
- Motels (transient)

**R-2** Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

- Apartment houses
- Boarding houses (not transient)
- Convents
- Dormitories
- Fraternities and sororities
- Hotels (nontransient)
- Monasteries
- Motels (nontransient)
- Vacation timeshare properties



Congregate living facilities with 16 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

**R-3** Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

Buildings that do not contain more than two dwelling units.

Adult facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.

Child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.

Congregate living facilities with 16 or fewer persons.

Adult and child care facilities that are within a single-family home are permitted to comply with the *International Residential Code*.

**R-4** Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff.

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code, or shall comply with the *International Residential Code*.

❖ Residential occupancies represent some of the highest fire safety risks of any of the occupancies listed in Chapter 3. There are several reasons for this condition:

- Structures in the residential occupancy house the widest range of occupant types, i.e., infants to the aged, for the longest periods of time. As such, residential occupancies are more susceptible to the frequency of careless acts of the occupants; therefore, the consequences of exposure to the effects of fire are the most serious.
- Most residential occupants are asleep approximately one-third of every 24-hour period. When sleeping, they are not likely to become immediately aware of a developing fire. Also, if awakened from sleep by the presence of fire, the residents often may not immediately react in a rational manner and delay their evacuation.
- The fuel load in residential occupancies is often quite high, both in quantity and variety. Also, in the construction of residential buildings, it is common to use extensive amounts of combustible materials.
- Another portion of the fire problem in residential occupancies relates to the occupants' lack of vigilance in the prevention of fire hazards. In their own domicile or residence, people tend to relax and are often prone to allow fire hazards to go unabated; thus, in residential occupancies,

fire hazards tend to accrue over an extended period of time and go unnoticed or are ignored.

Most of the nation's fire problems occur in Group R buildings and, in particular, one- and two-family dwellings, which account for more than 80 percent of all deaths from fire in residential occupancies and about two-thirds of all fire fatalities in all occupancies. One- and two-family dwellings also account for more than 80 percent of residential property losses from fire and more than one-half of all property losses from fire.

Because of the relatively high fire risk and potential for loss of life in buildings classified in Groups R-1 (hotels and motels) and R-2 (apartments and dormitories), the code has stringent provisions for the protection of life in these occupancies. Group R-3 occupancies, however, are not generally considered to be in the same domain and, thus, are not subject to the same level of regulatory control as is provided in other occupancies. Group R-3 facilities are one- or two-family dwellings where the occupants are generally more familiar with their surroundings, and, because they are single units or duplexes, tend to pose a lower risk of injury or death.

Because of the growing trend to care for people in a residential environment, residential care/assisted living facilities are also classified as Group R. Specifically, these facilities are classified as Group R-4. "Mainstreaming" people who are recovering from alcohol or drug addiction and people who are developmentally disabled is reported to have therapeutic and social benefits. A residential environment often fosters this mainstreaming.

Buildings in Group R are described herein. A building or part of a building is considered to be a residential occupancy if it is intended to be used for sleeping accommodations (including residential care/assisted living facilities) and is not an institutional occupancy. Institutional occupancies are similar to residential occupancies in many ways; however, they differ from each other in that institutional occupants are in a supervised environment, and, in the case of Groups I-2 and I-3 occupancies, are under some form of restraint or physical limitation that makes them incapable of complete self-preservation. The number of these occupants who are under supervision or are incapable of self-preservation is the distinguishing factor for being classified as an institutional or residential occupancy.

The term "Group R" refers collectively to the four individual residential occupancy classifications: Groups R-1, R-2, R-3 and R-4. These classifications are differentiated in the code based on the following criteria: (1) whether the occupants are transient or nontransient in nature; (2) the type and number of dwellings contained in a single building and (3) the number of occupants in the facility.

**R-1:** The key characteristic of Group R-1 that differentiates it from other Group R occupancies is the number of transient occupants (i.e., those whose length of stay is not more than 30 days).

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The most common building types classified in Group R-1 are hotels, motels and boarding houses. Group R-1 occupancies do not typically have cooking facilities in the unit. When a unit is not equipped with cooking facilities, it does not meet the definition of a "Dwelling unit" in Section 202. When this occurs, such units are treated as sleeping units for the application of code provisions [see Figure 310.1(1)]. Sleeping units are required to be separated from each other by fire partitions and horizontal assemblies (see Sections 419, 708.1 and 711.3). A recent trend in development is the construction of "extended-stay hotels." While these units may have all of the characteristics of a typical dwelling unit (i.e., cooking, living, sleeping, eating, sanitation), the length of stay is still typically not more than 30 days. As such, these buildings would still be classified as Group R-1. If the length of stay is more than 30 days, these buildings would be classified as Group R-2.

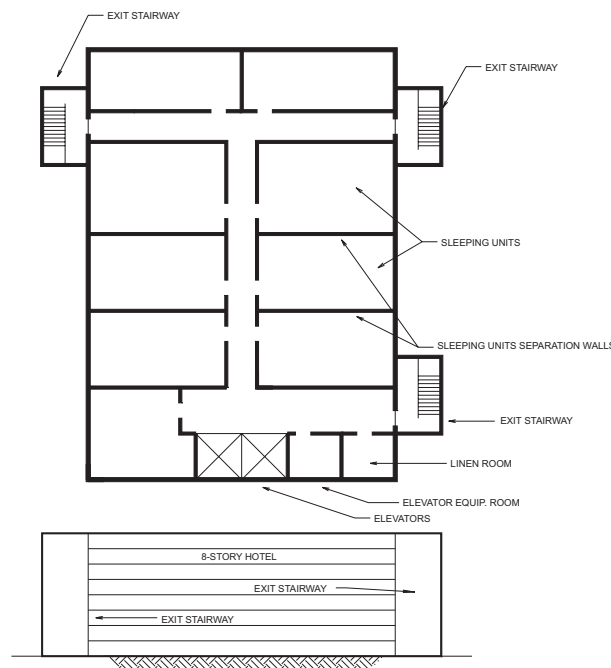
Other occupancies are often found in buildings classified in Group R-1. These occupancies include nightclubs (Group A-2), restaurants (Group A-2), gift shops (Group M), health clubs (Group A-3) and storage facilities (Group S-1). When this occurs, the building is a mixed occupancy and is subject to the provisions of Section 508.3.

**R-2:** The length of the occupants' stay plus the arrangement of the facilities provided are the basic factors that differentiate occupancies classified in Group R-2 from other occupancies in Group R. The

occupants of facilities or areas classified in Group R-2 are primarily nontransient, capable of self-preservation and share their means of egress in whole or in part with other occupants outside of their sleeping area or dwelling unit. The separation between dwelling units must, at a minimum, meet the requirements contained in Sections 419, 708.1 and 711.3. Building types ordinarily classified in Group R-2 include apartments, boarding houses (when the occupants are not transient) and dormitories [see Figures 310.1(2) and 310.1(3)].

Individual dwelling units in Group R-2 are either rented by tenants or owned by the occupants. The code does not make a distinction between either type of tenancy unless the dwelling unit is located on a separate parcel of land. When this occurs, lot lines defining the land parcel exist and the requirements for fire separation must be met.

Dormitories are generally associated with university or college campuses for use as student housing, but this is changing rapidly. Many dormitories are now being built as housing for elderly people who wish to live with other people their own age and who do not need 24-hour-a-day medical supervision. The only difference between the dormitory that has just been described and the dormitory found on a college campus is the age of its occupants. If the elderly people must have 24-hour-a-day medical supervision (i.e., a nurse or doctor on the premises), the building is no longer considered a residential occupancy but an institu-



**Figure 310.1(1)**  
**GROUP R-1—HOTEL**  
**(OCCUPANTS ARE PRIMARILY TRANSIENT)**

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tional occupancy (Group I-2 assuming greater than five occupants) and would have to comply with the applicable provisions of the code.

Similar to Group R-1, individual rooms in dormitories are also required to be separated from each other by fire partitions and horizontal assemblies in accordance with Sections 419, 708.1 and 711.3. When college classes are not in session, the rooms in dormitories are sometimes rented out for periods of not more than 30 days to convention attendees and other visitors. When dormitories undergo this type of transient use, they more closely resemble Group R-1.

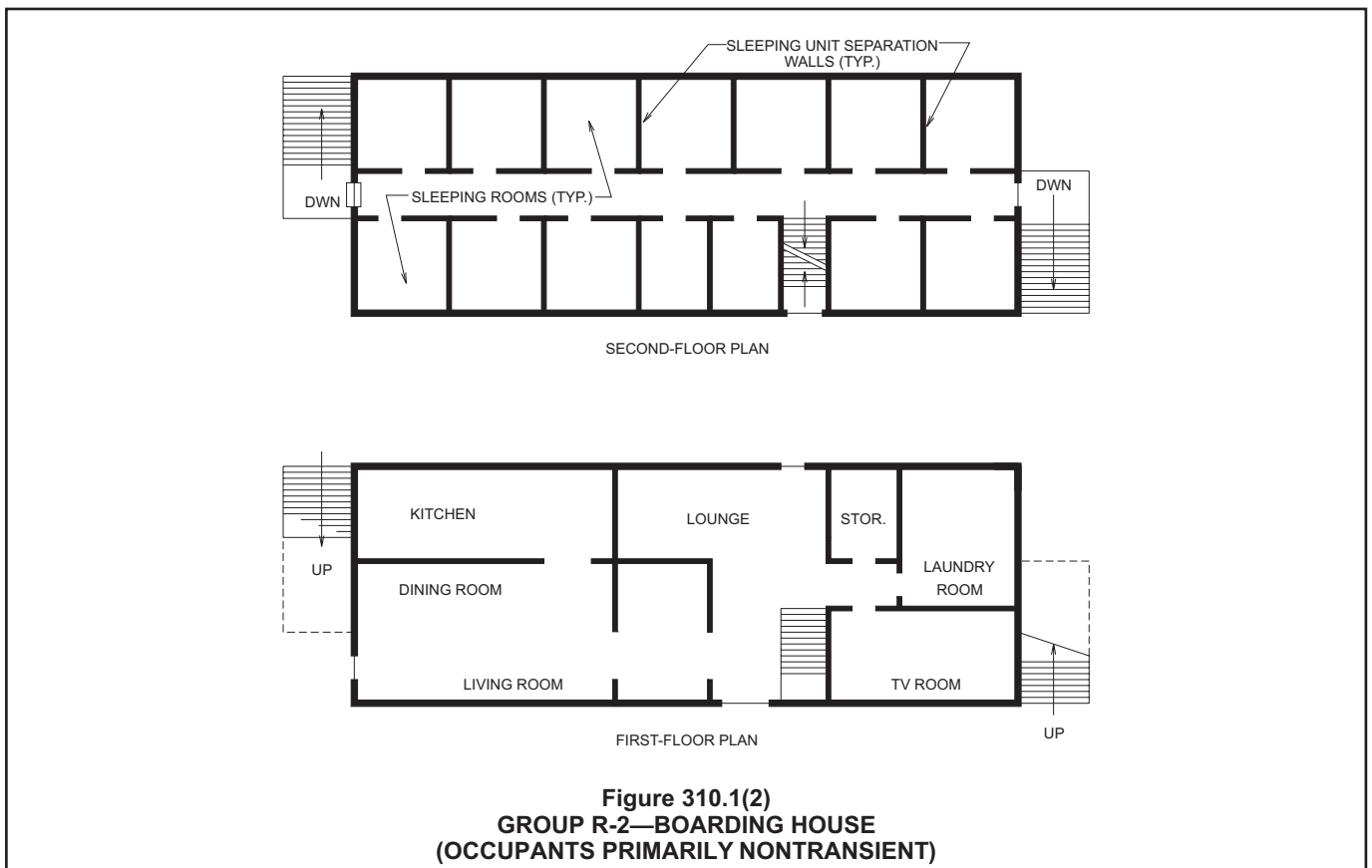
Buildings containing dormitories often contain other occupancies, such as cafeterias or dining rooms (Group A-2), recreation rooms (Group A-3) and office (Group B) or meeting rooms (Group A-3). When this occurs, the building is considered a mixed occupancy and is subject to the provisions of Section 508.3 [see Figure 310.1(4)].

The intent of the congregate living facility reference is to better define when a congregate living facility is operating as a single family home. Blended families are now commonplace and not necessarily defined strictly by blood or marriage. Small boarding houses, convents, dormitories, fraternities, sororities, monasteries and nontransient hotels and motels may be small enough to operate as a single-family unit and would be permitted to be con-

structed as Group R-3 occupancies as intended by the code. The threshold of 16 persons is consistent with the results of the most recent consensus, which has 98 percent of all homes in the U.S. containing less than 16 persons.

**R-3:** Group R-3 facilities include all detached one- and two-family dwellings and multiple (three or more) single-family dwellings (townhouses) more than three stories in height. Those buildings three or less stories in height are not classified as Group R-3 and must be regulated by the IRC (see Section 101.2). Each pair of dwelling units in multiple single-family dwellings greater than three stories in height must be separated by fire walls (see Section 705) or by two exterior walls (see Table 602) in order to be classified as Group R-3. Duplexes that are two stories in height (total) must be detached from other structures in order to be regulated to the IRC. A two-story duplex attached to another two-story duplex would be required to comply with the code and be classified as Group R-2 or Group R-3, depending on the presence of fire walls.

Buildings that are one- and two-family dwellings and multiple single-family dwellings less than three stories in height and that contain another occupancy (e.g., Groups B, M, I-4) must be regulated as a mixed occupancy in accordance with the code and are not required to comply with the provisions of the IRC [see Figures 310.1(5) and 310.1(6)].





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In addition, all institutional facilities that accommodate five or less people and all congregate living facilities with no more than 16 occupants are to be classified as Group R-3. Where these small care facilities are provided as a portion of a private home, the intent of the code is that the requirements would be the same as for a single-family home. As such, the provisions of the IRC can still be utilized.

Note that a Group R-3 occupancy is permitted to accommodate a maximum of 5 occupants. The occupants may be capable of responding to an emergency situation without physical assistance from staff as permitted in a Group I-1 occupancy or not capable of self-preservation as required for a Group I-2 occupancy. A facility that accommodates five persons who are "capable of responding to an emergency situation without physical assistance from staff" and five persons "who are not capable of self-preservation" cannot be classified as a Group R-3 because the total occupant load of 10 persons exceeds the permitted maximum of five occupants.

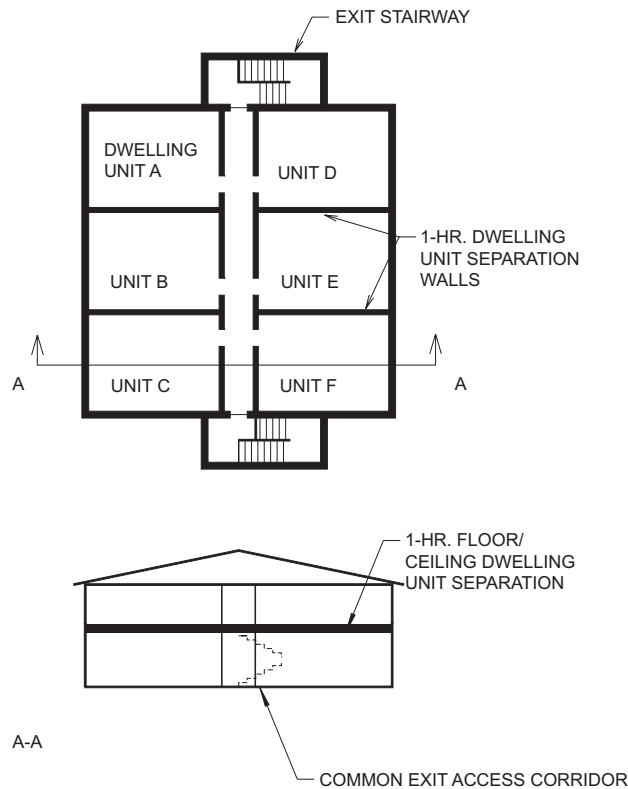
The facility is a single occupancy; therefore, the entire facility must be assumed to be occupied by persons with the most restrictive capability when determining the occupancy classification of the facility. A facility that accommodates 10 occupants

"who are not capable of self-preservation" is a Group I-2 occupancy.

Buildings that are classified as Group R-3, while limited in height, are not limited in the allowable area per floor as indicated in Table 503.

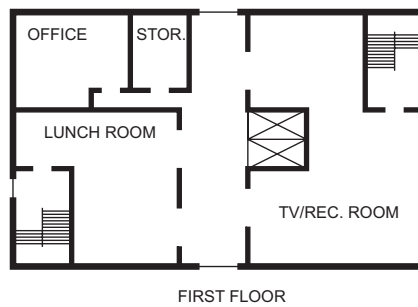
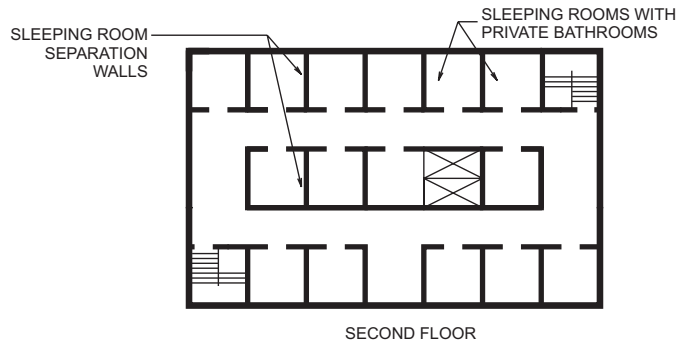
All dwelling units must be separated from each other by fire partitions and horizontal assemblies (in accordance with Sections 419, 708.1 and 711.3) unless required to be separated by fire walls.

**R-4:** When a limited number of people who require personal care live in a residential environment, a facility is no longer classified as Group I-1 but as a residential care/assisted living facility, Group R-4. Ninety-eight percent of households in the U.S. have less than 16 occupants, thus the limit of 16 would allow equal access for the disabled. The number of occupants is those that receive care and is not intended to include staff. A Group R-4 occupancy is not permitted to include any number of occupants that "are not capable of self-preservation." With the exception of height and area limitations, Group R-4 facilities must satisfy the construction requirements of Group R-3 or shall comply with the requirements of the IRC. Note that the provisions of the IBC and IRC shall not be mixed (i.e., either the IBC or IRC, but not both, shall be used).

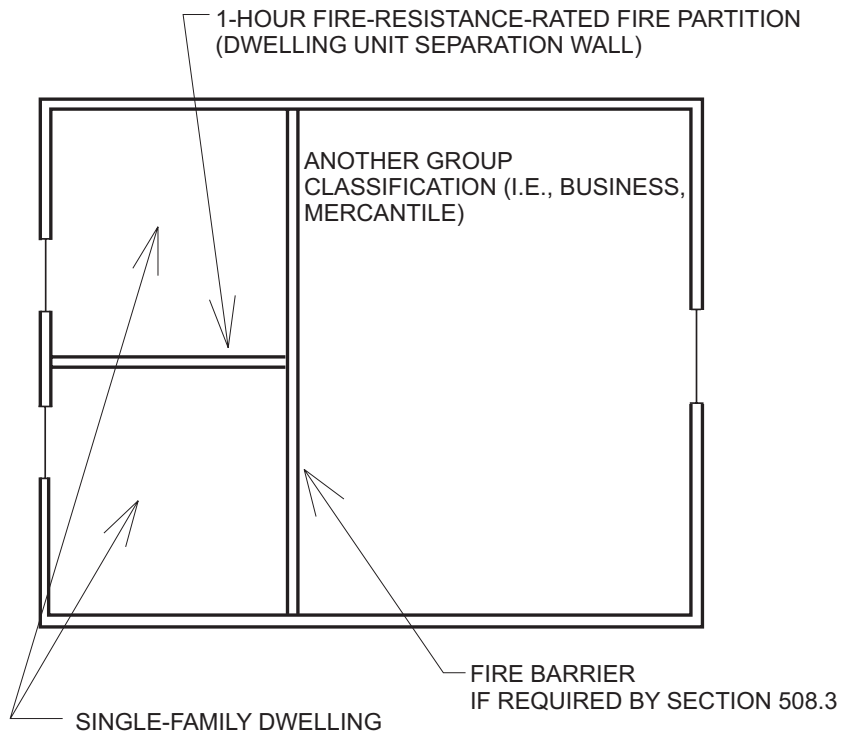


**Figure 310.1(3)**  
**GROUP R-2—APARTMENTS**  
**(OCCUPANTS PRIMARILY NONTRANSIENT)**

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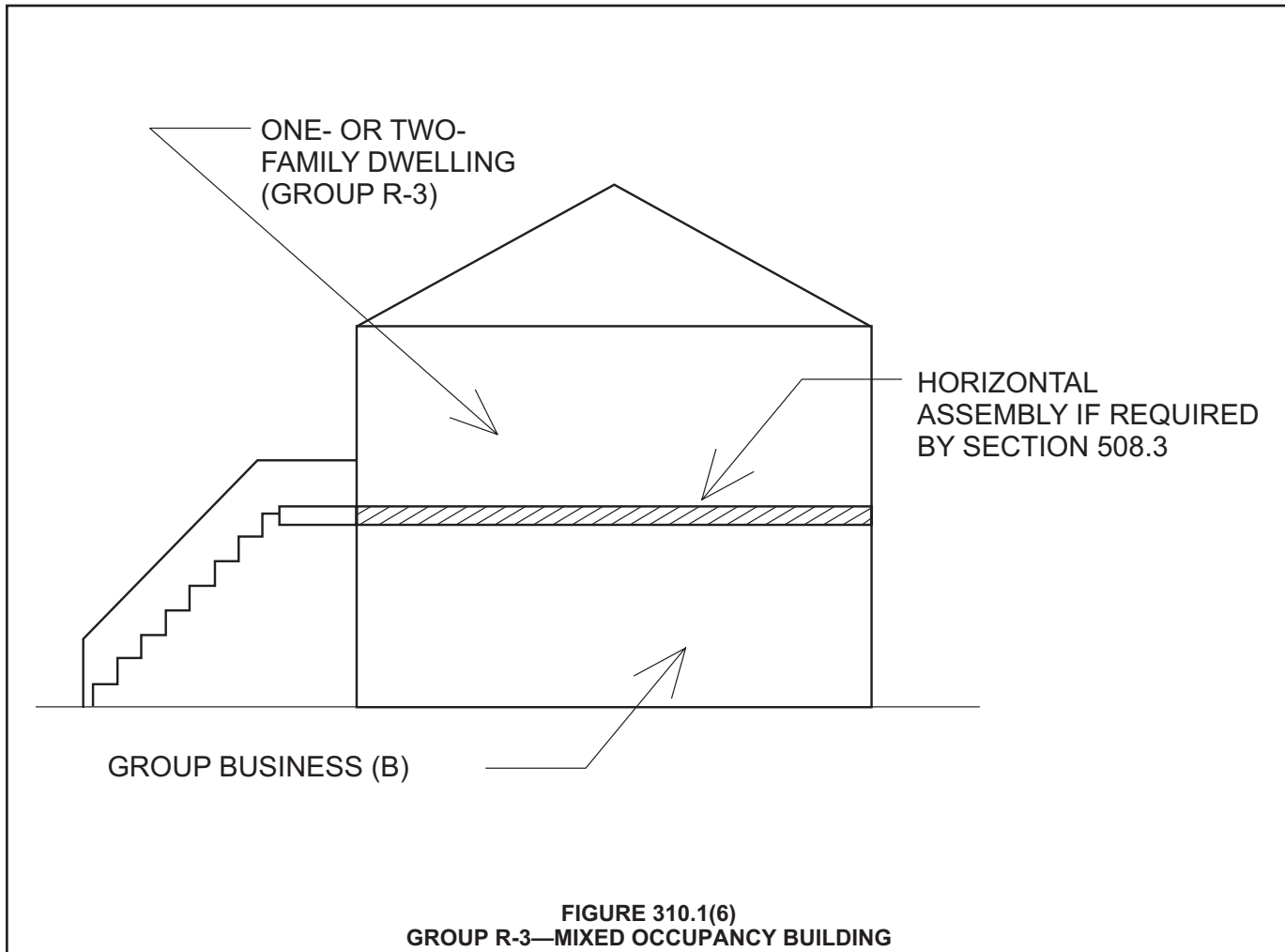


**Figure 310.1(4)**  
**GROUP R-2—DORMITORY**  
**(OCCUPANTS PRIMARILY NONTRANSIENT)**



**Figure 310.1(5)**  
**GROUP R-3—MIXED OCCUPANCY BUILDING**

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**310.2 Definitions.** The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

❖ Definitions of terms that are associated with the content of this section are contained herein. These definitions can help in the understanding and application of the code requirements. One should keep in mind, however, that in many cases, terms defined in the code may also be defined by ordinances and statutes of local and state governments. In such cases, code users must focus on the specific features that define the term relative to the code and not its generally held meaning.

It is important to emphasize that these terms are not exclusively related to this section, but are applicable everywhere the term is used in the code. The purpose for including these definitions within this section is to provide more convenient access to them without having to refer back to Chapter 2. For convenience, these terms are also listed in Chapter 2 with a cross reference to this section.

The use and application of all defined terms, including those defined herein, are set forth in Section 201.

**BOARDING HOUSE.** A building arranged or used for lodging for compensation, with or without meals, and not occupied as a single-family unit.

❖ A boarding house is a structure housing lodgers or boarders in which the occupants are provided lodging or meals and lodging for a fee. The individual rooms used for lodging usually do not contain all of the permanent living provisions of a dwelling unit (e.g., permanent cooking facilities). Most often, the term “boarding house” describes a facility that is primarily for transient occupants; however, these facilities might also be used for nontransient purposes. Depending on the extent of transiency, a boarding house could be classified as Group R-1 when an occupant typically stays for not more than 30 days or Group R-2 when the length of stay is greater than 30 days [see Section 310.1 and Figure 310.1(2)].

**CONGREGATE LIVING FACILITIES.** A building or part thereof that contains sleeping units where residents share bathroom and/or kitchen facilities.

❖ Congregate living facilities are those pertaining to group housing (i.e., dormitories, fraternities, convents) that combine individual sleeping quarters with commu-

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nal facilities for food, care, sanitation and recreation. The number of occupants in the facility determines the appropriate occupancy classification for the facility. A facility with 16 or less occupants is classified as Group R-3, while a facility with more than 16 occupants is classified as Group R.

**DORMITORY.** A space in a building where group sleeping accommodations are provided in one room, or in a series of closely associated rooms, for persons not members of the same family group, under joint occupancy and single management, as in college dormitories or fraternity houses.

- ❖ Dormitories typically consist of a large room serving as a community sleeping room or many smaller rooms grouped together and serving as private or semiprivate sleeping rooms. A typical setting for dormitories is on college campuses; however, sleeping areas of a fire station and similar lodging facilities for occupants not of the same family group are also considered dormitories. Dormitories most often are not the permanent residence of the occupants. They are typically occupied only for a designated period of time, such as a school year. Though limited, the period of occupancy is usually more than 30 days, which provides the occupant with a familiarity of the structure such that the occupancy is not considered transient. A dormitory is classified as Group R-2 (see Section 310.1).

Structures containing a dormitory often have a cafeteria or central eating area and common recreational areas. When such conditions exist, the structure must comply with the mixed occupancy provisions of the code [see Section 508.3 and Figure 310.1(4)].

**PERSONAL CARE SERVICE.** The care of residents who do not require chronic or convalescent medical or nursing care. Personal care involves responsibility for the safety of the resident while inside the building.

- ❖ Used in conjunction with Group I-1 and R-4 facilities, this item refers to personal care for residents in a supervised environment who do not require medical supervision. The purpose of personal care service is to distinguish between residents who require medical supervision and those who require solely physical supervision (i.e., to provide safety for the residents while inside the building).

While personal care service is also provided in Group I-4 adult care and child care facilities, these care facilities are not intended to be a residence for the people receiving care.

**RESIDENTIAL CARE/ASSISTED LIVING FACILITIES.** A building or part thereof housing persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provides personal care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This classification shall include, but not be limited to, the following: residential board and care facilities, assisted living facilities, halfway houses, group homes, congregate care facili-

ties, social rehabilitation facilities, alcohol and drug abuse centers and convalescent facilities.

- ❖ Residential care/assisted living facilities are essentially Group I-1 facilities with a smaller number of occupants. The same provisions that are applicable to Group I-1 facilities are applicable to residential care/assisted living facilities (e.g., occupants are there on a 24-hour basis and are capable of responding to an emergency situation without physical assistance).

**TRANSIENT.** Occupancy of a dwelling unit or sleeping unit for not more than 30 days.

- ❖ The intent of this definition is to establish a time parameter to differentiate between transient and nontransient as listed under Groups R-1 and R-2. Real estate law dictates that a lease must be created after 30 days and 30+ day time periods are typically how extended-say hotels and motels rent to people. Such a time period gives the occupant time to be familiar with the surroundings and, therefore, become more accustomed to any hazards of the built environment than an overnight guest would be or a guest who stays for just a few days. Since nontransient occupancies do not have the same level of protection in the code as transient occupancies, it is important to determine what makes an occupancy transient so as to provide consistency in enforcement.

Since the requirements for Type B units are tied to the facilities that are intended to be occupied as a residence under both the Group R-1 and Group R-2, this definition does not have a detrimental effect on matching the Fair Housing Act provisions.

## SECTION 311 STORAGE GROUP S

**311.1 Storage Group S.** Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy.

- ❖ This section requires that all structures (or parts thereof) designed or occupied for the storage of moderate- and low-hazard materials are to be classified in either Group S-1 (moderate hazard) or S-2 (low hazard). Even though a storage facility may be part of another occupancy or stand alone as a separate building or operation, the characteristics of the occupancy and the level of hazards present in such facilities require that storage occupancies be treated as separate and distinct considerations in the code enforcement process.

The life safety problems in structures used for storage of moderate- and low-hazard materials are minimal because the number of people involved in a storage operation is usually small and normal work patterns require the occupants to be dispersed throughout the facility.

The problems of fire safety, particularly as they relate to the protection of stored contents, are directly



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associated with the amount and combustibility of the materials (including packaging) that are housed on the premises.

Storage facilities typically contain significant amounts of combustible or noncombustible materials that are kept in a common area. Because of the combustion or explosive characteristics of certain materials (see Section 307), a structure (or portion thereof) that is used to store high-hazard materials, which does not meet one of the exceptions identified in Section 307.1, may not be classified as Group S and is to be classified as Group H, high-hazard uses, and is to comply with Section 307.

Storage occupancies consist of two basic types: Groups S-1 and S-2, which are based on the properties of the materials being stored. The distinction between Groups S-1 and S-2 is similar to that between Groups F-1 and F-2, as outlined in Section 306.

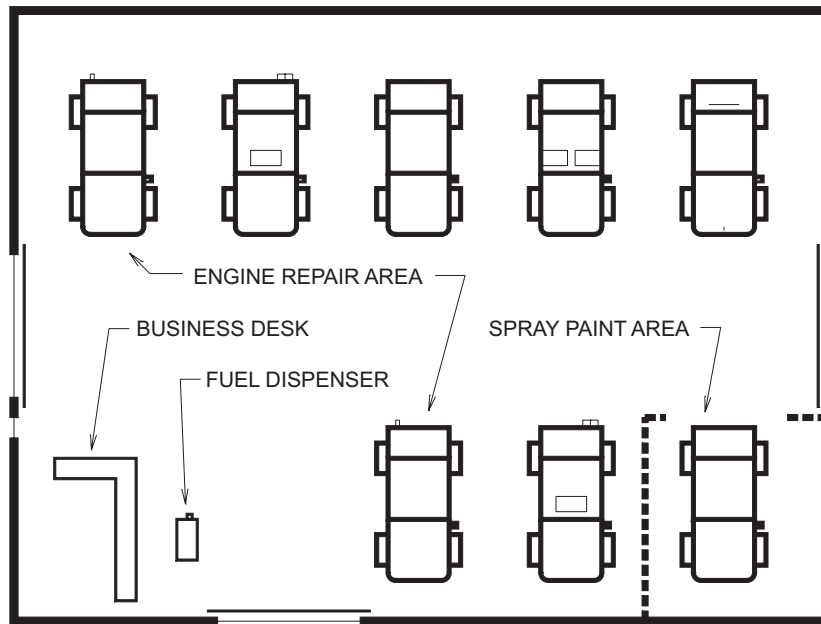
**311.2 Moderate-hazard storage, Group S-1.** Buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

- Aerosols, Levels 2 and 3
- Aircraft repair hangar
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage

- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lumber
- Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 307.1(1) (see Section 406.6)
- Photo engravings
- Resilient flooring
- Silks
- Soaps
- Sugar
- Tires, bulk storage of
- Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Wax candles

❖ Buildings in which combustible materials are stored and that burn with ease are classified in Group S-1, moderate-hazard storage occupancies. Examples of the kinds of materials that, when stored, are representative of occupancies classified in Group S-1 are also listed in this section.

As defined by the IFC, a repair garage is any structure used for servicing or repairing motor vehicles. Therefore, regardless of the extent of work done (e.g., quick lube, tune-up, muffler and tire shops, painting, body work, engine overhaul) repair garages are classified as Group S-1 (see Figure 311.2) and must be in



**Figure 311.2**  
**GROUP S-1—REPAIR GARAGES**

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compliance with Section 406.6. In addition, to avoid a Group H classification, the amounts of hazardous materials in the garage must be less than the maximum allowable quantity per control area permitted in Table 307.1(1).

**311.3 Low-hazard storage, Group S-2.** Includes, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles or film wrapping. Storage uses shall include, but not be limited to, storage of the following:

- Aircraft hangar
- Asbestos
- Beverages up to and including 12-percent alcohol in metal, glass or ceramic containers
- Cement in bags
- Chalk and crayons
- Dairy products in nonwaxed coated paper containers
- Dry cell batteries
- Electrical coils
- Electrical motors
- Empty cans
- Food products
- Foods in noncombustible containers
- Fresh fruits and vegetables in nonplastic trays or containers
- Frozen foods
- Glass
- Glass bottles, empty or filled with noncombustible liquids
- Gypsum board
- Inert pigments
- Ivory
- Meats
- Metal cabinets
- Metal desks with plastic tops and trim
- Metal parts
- Metals
- Mirrors

- Oil-filled and other types of distribution transformers
- Parking garages, open or enclosed
- Porcelain and pottery
- Stoves
- Talc and soapstones
- Washers and dryers

❖ Buildings in which noncombustible materials are stored are classified as Group S-2, low-hazard storage occupancies (see Figure 311.3). It is acceptable for stored noncombustible products to be packaged in combustible materials as long as the quantity of packaging is kept to an insignificant level.

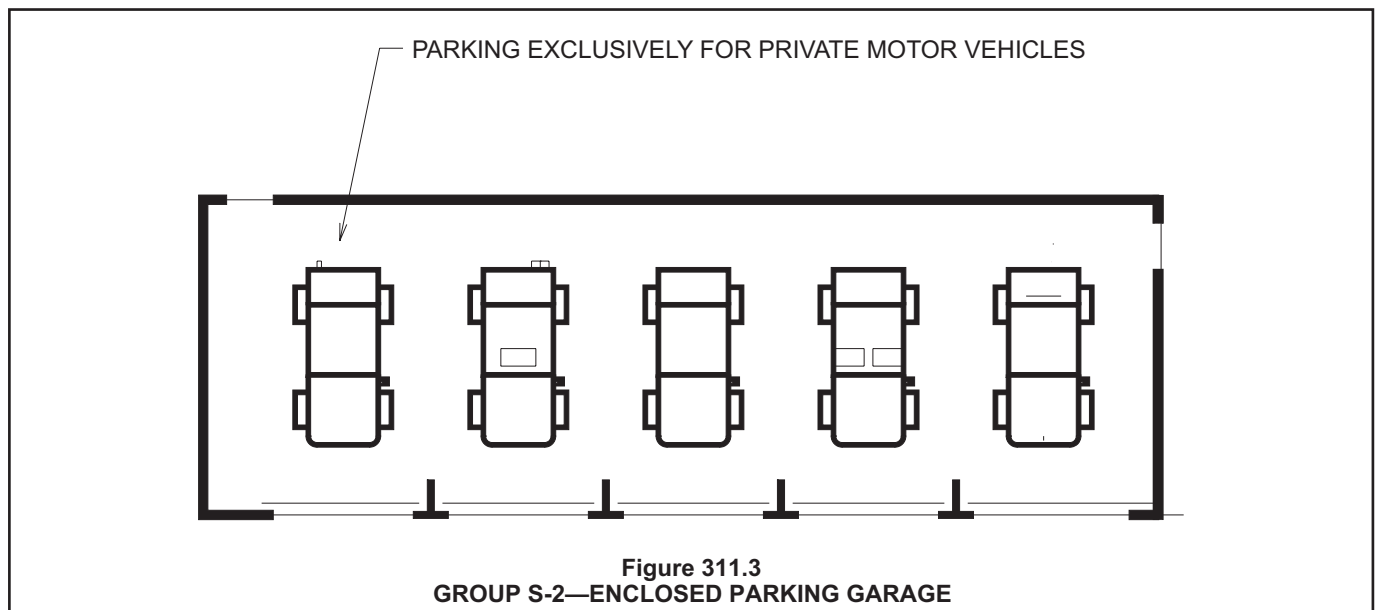
As seen in Group F-1 and F-2 classifications, it is important to be able to distinguish when the presence of combustible packaging constitutes a significant fuel load. As such, a fuel load might require the building to be classified in Group S-1, moderate-hazard storage. A simple guideline to follow is the "single thickness" rule, which is when a noncombustible product is put in one layer of packaging material.

Examples of materials qualified for storage in Group S-2 storage facilities are as follows:

- Vehicle engines placed on wood pallets for transportation after assembly;
- Washing machines in corrugated cardboard boxes; and
- Soft-drink glass bottles packaged in pressed paper boxes.

Structures used to store noncombustible materials packaged in more than one layer of combustible packaging material are to be classified in Group S-1. Examples of materials that, because of packaging, do not qualify for classification in Group S-2 are:

- Chinaware wrapped in corrugated paper and placed in cardboard boxes;



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- Glassware set in expanded foam forms and placed in a cardboard box; and
- Fuel filters individually packed in pressed paper boxes, placed by the gross in a cardboard box and then stacked on a wood pallet for transportation.

### SECTION 312 UTILITY AND MISCELLANEOUS GROUP U

**312.1 General.** Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

- Agricultural buildings
- Aircraft hangars, accessory to a one- or two-family residence (see Section 412.3)
- Barns
- Carports
- Fences more than 6 feet (1829 mm) high
- Grain silos, accessory to a residential occupancy
- Greenhouses
- Livestock shelters
- Private garages
- Retaining walls
- Sheds
- Stables
- Tanks
- Towers

❖ This section identifies the characteristics of occupancies classified in Group U. Structures that are classified in Group U are typically accessory to another building or structure and are not more appropriately classified in another occupancy. Miscellaneous storage buildings accessory to detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height, however, are intended to be designed and built in accordance with the IRC (see Section 101.2).

Structures classified as Group U, such as fences, equipment, foundations, retaining walls, etc., are somewhat outside the primary scope of the code (i.e., means of egress, fire resistance). They are not usually considered to be habitable or occupiable. Nevertheless, many code provisions do apply and need to be enforced (e.g., structural design and material performance).

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- NFPA 704-01, *Identification of the Hazards of Materials for Emergency Response*. Quincy, MA: National Fire Protection Association, 2001.
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- USC Title 18; Chapter 40-70, *Importation, Manufacture, Distribution and Storage of Explosive Materials*. Washington, DC: United States Code, 1970.



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# Chapter 4: Special Detailed Requirements Based On Use and Occupancy

## General Comments

The provisions of Chapter 4 are supplemental to the remainder of the code. Chapter 4 contains provisions that may alter requirements found elsewhere in the code; however, the general requirements of the code still apply unless modified within the chapter. For example, the height and area limitations established in Chapter 5 apply to all special occupancies unless Chapter 4 contains height and area limitations. In this case, the limitations in Chapter 4 supersede those in other sections. An example of this is the height and area limitations given in Section 406.3.5, which supersede the limitations given in Table 503 and Section 503 for open parking garages.

The *International Fire Code*<sup>®</sup> (IFC<sup>®</sup>) contains provisions applicable to the storage, handling and use of hazardous substances, materials or devices and, therefore, must also be complied with when dealing with such occupancies as those involving flammable and combustible liquids. Similarly, the *International Mechanical Code*<sup>®</sup> (IMC<sup>®</sup>) and the *International Plumbing Code*<sup>®</sup> (IPC<sup>®</sup>) include provisions for specific applications, such as hazardous exhaust systems and hazardous material piping.

In some instances, it may not be necessary to apply the provisions of Chapter 4. For example, if a covered mall building complies with the provisions of the code for Group M, Section 402 does not apply; however, other sections that deal with a use, process or operation must be applied to that specific occupancy, such as Sections 410, 411 and 414.

## Purpose

The purpose of Chapter 4 is to combine in one chapter the provisions of the code applicable to special uses and occupancies. Hazardous occupancies and operations may occur in more than one group; therefore, the applicable provisions for the specific hazardous occupancy or operation apply to multiple groups. Also, while the provisions for all structures are interrelated to form an overall protection system by providing requirements for specific occupancies in Chapter 4, the package of protection features is more easily identified.

Chapter 4 contains the requirements for protecting special uses and occupancies. The provisions in this chapter reflect those occupancies and groups that require special consideration and are not addressed elsewhere in the code. The chapter includes requirements for buildings and conditions that apply to one or more groups, such as high-rise buildings or atriums. Special uses may also imply specific occupancies and operations, such as for Groups H-1, H-2, H-3, H-4 and H-5, application of flammable finishes and combustible storage or for a specific occupancy within a much larger occupancy, such as covered mall buildings, motor-vehicle-related occupancies, special amusement buildings and aircraft-related occupancies. Finally, in order that the overall package of protection features can be easily understood, occupancies such as Groups I-2 and I-3 and underground buildings are addressed.

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## SECTION 401 SCOPE

**401.1 Detailed use and occupancy requirements.** In addition to the occupancy and construction requirements in this code, the provisions of this chapter apply to the special uses and occupancies described herein.

- ❖ This section provides guidance on how Chapter 4 is to be applied with respect to other sections of the code. Section 401.1 indicates that all other provisions of the code apply except as modified by Chapter 4.

The requirements contained in Chapter 4 are in-

tended to apply to special uses and occupancies as defined by the various sections in this chapter. These requirements are applicable in addition to other chapters of the code.

## SECTION 402 COVERED MALL BUILDINGS

**402.1 Scope.** The provisions of this section shall apply to buildings or structures defined herein as covered mall buildings not exceeding three floor levels at any point nor more than three stories above grade plane. Except as specifically required by