

2007 Florida Building Code, Building

First Printing

FLORIDA BUILDING CODE

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PREFACE

History

The State of Florida first mandated statewide building codes during the 1970s at the beginning of the modern construction boom. The first law required all municipalities and counties to adopt and enforce one of the four state-recognized model codes known as the “state minimum building codes.” During the early 1990s a series of natural disasters, together with the increasing complexity of building construction regulation in vastly changed markets, led to a comprehensive review of the state building code system. The study revealed that building code adoption and enforcement was inconsistent throughout the state and those local codes thought to be the strongest proved inadequate when tested by major hurricane events. The consequences of the building codes system failure were devastation to lives and economies and a statewide property insurance crisis. The response was a reform of the state building construction regulatory system that placed emphasis on uniformity and accountability.

The 1998 Florida Legislature amended Chapter 553, *Florida Statutes* (FS), Building Construction Standards, to create a single state building code that is enforced by local governments. As of March 1, 2002, the *Florida Building Code*, which is developed and maintained by the Florida Building Commission, supersedes all local building codes. The Florida Building Code is updated every three years and may be amended annually to incorporate interpretations and clarifications.

Scope

The *Florida Building Code* is based on national model building codes and national consensus standards which are amended where necessary for Florida’s specific needs. The code incorporates all building construction-related regulations for public and private buildings in the State of Florida other than those specifically exempted by Section 553.73, Florida Statutes. It has been harmonized with the *Florida Fire Prevention Code*, which is developed and maintained by the Department of Financial Services, Office of the State Fire Marshal, to establish unified and consistent standards.

The base codes for the 2007 edition of the *Florida Building Code* include: the *International Building Code*®, 2006 edition; the *International Plumbing Code*®, 2006 edition; the *International Mechanical Code*®, 2006 edition; the *International Fuel Gas Code*®, 2006 edition; the *International Residential Code*®, 2006 edition; the *International Existing Building Code*®, 2006 edition; the *National Electrical Code*, 2005 edition; the U. S. Department of Housing and Urban Development, *Fair Housing Guidelines*, and; substantive criteria from the American Society of Heating, Refrigerating and Air-conditioning Engineers’ (ASHRAE) Standard 90.1-2004. State and local codes adopted and incorporated into the code include the *Florida Energy Efficiency Code for Building Construction*, the *Florida Accessibility Code for Building Construction* and special hurricane protection standards for the high-velocity hurricane zone.

The code is composed of seven main volumes: the *Florida Building Code, Building*, which also includes Chapter 13 (energy efficiency) and Chapter 11 (accessibility) as well as state regulations for licensed facilities; the *Florida Building Code, Plumbing*; the *Florida Building Code, Mechanical*; the *Florida Building Code, Fuel Gas*; the *Florida Existing Building Code*; the *Florida Building Code, Residential*; and the *Florida Building Code, Test Protocols for High-Velocity Hurricane Zones*. Chapter 27 of the *Florida Building Code, Building*, adopts the *National Electrical Code*, NFPA 70, by reference. Chapter 33 of the *Florida Building Code, Residential* adopts the *National Electrical Code Requirements for One- and Two-Family Dwellings*, NFPA 70A, by reference.

Under certain strictly defined conditions, local governments may amend requirements to be more stringent than the code. All local amendments to the *Florida Building Code* must be adopted by local ordinance and reported to the Florida Building Commission then posted on www.floridabuilding.org in Legislative format for a month before being enforced. Local amendments to the *Florida Building Code* and the *Florida Fire Prevention Code* may be obtained from the Florida Building Commission web site, or from the Florida Department of Community Affairs or the Florida Department of Financial Services, Office of the State Fire Marshal, respectively.

Adoption and Maintenance

The *Florida Building Code* is adopted and updated with new editions triennially by the Florida Building Commission. It is amended annually to incorporate interpretations, clarifications and to update standards. Minimum requirements for permitting, plans review and inspections are established by the code, and local jurisdictions may adopt additional administrative requirements that are more stringent. Local technical amendments are subject to strict criteria established by Section 553.73, F.S. They are subject to commission review and adoption into the code or repeal when the code is updated triennially and are subject to appeal to the Commission according to the procedures established by Section 553.73, F.S.

Ten Technical Advisory Committees (TACs), which are constituted consistent with American National Standards Institute (ANSI) Guidelines, review proposed code changes and clarifications of the code and make recommendations to the Commission. These TACs whose membership is constituted consistent with American National Standards Institute (ANSI) Guidelines include: Accessibility; Joint Building Fire (a joint committee of the Commission and the State Fire Marshal); Building Structural; Code Ad-

ministration/ Enforcement; Electrical; Energy; Mechanical; Plumbing and Fuel Gas; Roofing; and Special Occupancy (state agency construction and facility licensing regulations).

The Commission may only issue official code clarifications using procedures of Chapter 120, Florida Statutes. To obtain such a clarification, a request for a Declaratory Statement (DEC) must be made to the Florida Building Commission in a manner that establishes a clear set of facts and circumstances and identifies the section of the code in question. Requests are analyzed by staff, reviewed by the appropriate Technical Advisory Committee, and sent to the Florida Building Commission for a first action. Draft Declaratory Statements are subject to public comment and are finalized by the Commission at its next meeting. These interpretations establish precedents for situations having similar facts and circumstances and are typically incorporated into the code in the next code amendment cycle. Non-binding opinions are available from the Building Officials Association of Florida's web site (www.BOAF.net) and a Binding Opinion process is available online at www.floridabuilding.org.

Marginal Markings

Vertical lines in the margins within the body of the code indicate a change from the requirements of the base codes to the 2007 *Florida Building Code* effective October 1, 2008.

Sections deleted from the base code are designated "Reserved."

Acknowledgments

The *Florida Building Code* is produced through the efforts and contributions of building designers, contractors, product manufacturers, regulators and other interested parties who participate in the Florida Building Commission's consensus processes, Commission staff and the participants in the national model code development processes.

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FLORIDA BUILDING CODE

FINAL DRAFT

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CHAPTER 1

ADMINISTRATION

SECTION 101 GENERAL

101.1 Title. These regulations shall be known as the *Florida Building Code* hereinafter referred to as “this 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.

Exceptions:

1. 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 *Florida Building Code, Residential*.
2. Existing buildings undergoing repair, alterations or additions and change of occupancy shall comply with Chapter 34 of this code.

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

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.

101.4 Referenced codes. The other codes listed in Sections 101.4.1 through 101.4.9 and referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

101.4.1 Electrical. The provisions of Chapter 27 of the *Florida Building Code, Building* shall apply to the installation of electrical systems, including alterations, repairs, replacement, equipment, appliances, fixtures, fittings and appurtenances thereto.

101.4.2 Gas. The provisions of the *Florida Building Code, Fuel Gas* 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.

101.4.3 Mechanical. The provisions of the *Florida Building Code, Mechanical* 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.

101.4.4 Plumbing. The provisions of the *Florida Building Code, Plumbing* 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.

101.4.5 Property maintenance. Reserved.

101.4.6 Fire prevention. For provisions related to fire prevention, refer to the *Florida Fire Prevention Code*. The *Florida Fire Prevention 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.

101.4.7 Energy. The provisions of Chapter 13 of the *Florida Building Code, Building* shall apply to all matters governing the design and construction of buildings for energy efficiency.

101.4.8 Accessibility. For provisions related to accessibility, refer to Chapter 11 of the *Florida Building Code, Building*.

101.4.9 Manufactured buildings. For additional administrative and special code requirements, see section 428, *Florida Building Code, Building*, and Rule 9B-1 F.A.C.

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.

102.1.1 The *Florida Building Code* does not apply to, and no code enforcement action shall be brought with respect to, zoning requirements, land use requirements and owner specifications or programmatic requirements which do not pertain to and govern the design, construction, erection, alteration, modification, repair or demolition of public or private buildings, structures or facilities or to programmatic requirements that do not pertain to enforcement of the *Florida Building Code*. Additionally, a local code enforcement agency may not administer or enforce the *Florida Building Code, Building* to prevent the siting of any publicly owned facility, including, but not limited to, correc-

tional facilities, juvenile justice facilities, or state universities, community colleges, or public education facilities, as provided by law.

102.2 Building. The provisions of the *Florida Building Code* shall apply to the construction, erection, alteration, modification, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every public and private building, structure or facility or floating residential structure, or any appurtenances connected or attached to such buildings, structures or facilities. Additions, alterations, repairs and changes of use or occupancy group in all buildings and structures shall comply with the provisions provided in Chapter 34 of this code. The following buildings, structures and facilities are exempt from the *Florida Building Code* as provided by law, and any further exemptions shall be as determined by the legislature and provided by law:

- (a) Building and structures specifically regulated and preempted by the federal government.
- (b) Railroads and ancillary facilities associated with the railroad.
- (c) Nonresidential farm buildings on farms.
- (d) Temporary buildings or sheds used exclusively for construction purposes.
- (e) Mobile or modular structures used as temporary offices, except that the provisions of Part V (Section 553.501-553.513, *Florida Statutes*) relating to accessibility by persons with disabilities shall apply to such mobile or modular structures.
- (f) Those structures or facilities of electric utilities, as defined in Section 366.02, *Florida Statutes*, which are directly involved in the generation, transmission or distribution of electricity.
- (g) Temporary sets, assemblies or structures used in commercial motion picture or television production, or any sound-recording equipment used in such production, on or off the premises.
- (h) Chickees constructed by the Miccosukee Tribe of Indians of Florida or the Seminole Tribe of Florida. As used in this paragraph, the term “chickee” means an open-sided wooden hut that has a thatched roof of palm or palmetto or other traditional materials, and that does not incorporate any electrical, plumbing or other nonwood features.

102.2.1 In addition to the requirements of Section 553.79 and 553.80, *Florida Statutes*, facilities subject to the provisions of Chapter 395, *Florida Statutes*, and Part II of Chapter 400, *Florida Statutes*, shall have facility plans reviewed and construction surveyed by the state agency authorized to do so under the requirements of Chapter 395, *Florida Statutes*, and Part II of Chapter 400, *Florida Statutes*, and the certification requirements of the federal government.

102.2.2 Residential buildings or structures moved into or within a county or municipality shall not be required to be brought into compliance with the state minimum

building code in force at the time the building or structure is moved, provided:

1. The building or structure is structurally sound and in occupiable condition for its intended use;
2. The occupancy use classification for the building or structure is not changed as a result of the move;
3. The building is not substantially remodeled;
4. Current fire code requirements for ingress and egress are met;
5. Electrical, gas and plumbing systems meet the codes in force at the time of construction and are operational and safe for reconnection; and
6. Foundation plans are sealed by a professional engineer or architect licensed to practice in this state, if required by the *Florida Building Code, Building* for all residential buildings or structures of the same occupancy class.

102.2.3 The building official shall apply the same standard to a moved residential building or structure as that applied to the remodeling of any comparable residential building or structure to determine whether the moved structure is substantially remodeled.

The cost of the foundation on which the moved building or structure is placed shall not be included in the cost of remodeling for purposes of determining whether a moved building or structure has been substantially remodeled.

102.2.4 This section does not apply to the jurisdiction and authority of the Department of Agriculture and Consumer Services to inspect amusement rides or the Department of Financial Services to inspect state-owned buildings and boilers.

102.2.5 Each enforcement district shall be governed by a board, the composition of which shall be determined by the affected localities. At its own option, each enforcement district or local enforcement agency may promulgate rules granting to the owner of a single-family residence one or more exemptions from the *Florida Building Code* relating to:

1. Addition, alteration or repair performed by the property owner upon his or her own property, provided any addition or alteration shall not exceed 1,000 square feet (93 m²) or the square footage of the primary structure, whichever is less.
2. Addition, alteration or repairs by a nonowner within a specific cost limitation set by rule, provided the total cost shall not exceed \$5,000 within any 12-month period.
3. Building and inspection fees.

Each code exemption, as defined in this section, shall be certified to the local board 10 days prior to implementation and shall be effective only in the territorial jurisdiction of the enforcement district or local enforcement agency implementing it.

102.2.6 This section does not apply to swings and other playground equipment accessory to a one- or two-family dwelling.

Exception: Electrical service to such playground equipment shall be in accordance with Chapter 27 of this code.

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.

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.

102.5 Partial invalidity. Reserved.

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, or the *Florida Fire Prevention Code*, or as is deemed necessary by the building official for the general safety and welfare of the occupants and the public.

102.7 Relocation of manufactured buildings.

1. Relocation of an existing manufactured building does not constitute an alteration.
2. A relocated building shall comply with wind speed requirements of the new location, using the appropriate wind speed map. If the existing building was manufactured in compliance with the *Standard Building Code* (prior to March 1, 2002), the wind speed map of the *Standard Building Code* shall be applicable. If the existing building was manufactured in compliance with the *Florida Building Code* (after March 1, 2002), the wind speed map of the *Florida Building Code* shall be applicable.

**SECTION 103
DEPARTMENT OF BUILDING SAFETY
RESERVED**

**SECTION 104
DUTIES AND POWERS OF THE
BUILDING OFFICIAL**

104.1 General. Reserved.

104.2 Applications and permits. Reserved.

104.3 Notices and orders. Reserved.

104.4 Inspections. Reserved.

104.5 Identification. Reserved.

104.6 Right of entry. Reserved.

104.7 Department records. Reserved.

104.8 Liability. Reserved.

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.

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.

104.10 Modifications. Reserved.

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. When alternate life safety systems are designed, the SFPE *Engineering Guide to Performance-Based Fire Protection Analysis and Design of Buildings*, or other methods approved by the building official may be used. The building official shall require that sufficient evidence or proof be submitted to substantiate any claim made regarding the alternative.

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.

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.

104.11.3 Accessibility. Alternative designs and technologies for providing access to and usability of a facility for persons with disabilities shall be in accordance with Section 11-2.2.

**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 required impact-resistant coverings, 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.

105.1.1 Annual facility permit. In lieu of an individual permit for each alteration to an existing electrical, gas, mechanical, plumbing or interior nonstructural office system(s), the building official is authorized to issue an annual permit for any occupancy to facilitate routine or emergency service, repair, refurbishing, minor renovations of service systems or manufacturing equipment installations/relocations. The building official shall be notified of major changes and shall retain the right to make inspections at the facility site as deemed necessary. An annual facility permit shall be assessed with an annual fee and shall be valid for one year from date of issuance. A separate permit shall be obtained for each facility and for each construction trade, as applicable. The permit application shall contain a general description of the parameters of work intended to be performed during the year.

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.

105.1.3 Food permit. As per Section 500.12, *Florida Statutes*, a food permit from the Department of Agriculture and Consumer Services is required of any person who operates a food establishment or retail store.

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. Permits shall not be required for the following:

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 which does not alter its approval or make it unsafe.
6. Portable evaporative cooler.
7. Self-contained refrigeration system containing 10 pounds (4.54 kg) or less of refrigerant and actuated by motors of 1 horsepower (746 W) or less.
8. The installation, replacement, removal or metering of any load management control device.

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.

105.2.1 Emergency repairs. Where equipment replacements and repairs must be performed in an emergency situation, the permit application shall be submitted within the next working business day to the building official.

105.2.2 Minor repairs. Ordinary minor repairs may be made with the approval of the building official without a permit, provided the repairs do 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; additionally, ordinary minor repairs shall not 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 systems or mechanical equipment or other work affecting public health or general safety, and such repairs shall not violate any of the provisions of the technical codes.

105.2.3 Public service agencies. Reserved.

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 building department for that purpose. Permit application forms shall be in the format prescribed by a local administrative board, if applicable, and must comply with the requirements of Section 713.135(5) and (6), *Florida Statutes*.

Each application shall be inscribed with the date of application, and the code in effect as of that date. For a building permit for which an application is submitted prior to the effective date of the *Florida Building Code*, the state minimum building code in effect in the permitting jurisdiction on the date of the application governs the permitted work for the life of the permit and any extension granted to the permit.

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. When authorized through contractual agreement with a school board, in acting on applications for permits, the building official shall give first priority to any applications for the construction of, or addition or renovation to, any school or educational facility.

105.3.1.1 If a state university, state community college or public school district elects to use a local government's code enforcement offices, fees charged by counties and municipalities for enforcement of the *Florida Building Code* on buildings, structures, and facilities of state universities, state colleges and public school districts shall not be more than the actual labor and administrative costs incurred for plans review and inspections to ensure compliance with the code.

105.3.1.2 No permit may be issued for any building construction, erection, alteration, modification, repair or addition unless the applicant for such permit provides to the enforcing agency which issues the permit any of the following documents which apply to the construction for which the permit is to be issued and which shall be prepared by or under the direction of an engineer registered under Chapter 471, *Florida Statutes*:

1. Plumbing documents for any new building or addition which requires a plumbing system with more than 250 fixture units or which costs more than \$50,000.
2. Fire sprinkler documents for any new building or addition which includes a fire sprinkler system which contains 50 or more sprinkler heads. A Contractor I, Contractor II or Contractor IV, certified under Section 633.521, *Florida Statutes*, may design a fire sprinkler system of 49 or fewer heads and may design the alteration of an existing fire sprinkler system if the alteration consists of the relocation, addition or deletion of not more than 49 heads, notwithstanding the size of the existing fire sprinkler system.
3. Heating, ventilation and air-conditioning documents for any new building or addition which requires more than a 15-ton-per-system capacity which is designed to accommodate 100 or more persons or for which the system costs more than \$50,000. This paragraph does not include any document for the replacement or repair of an existing system in which the work does not require altering a structural part of the building or for work on a residential one-, two-, three or four-family structure.

An air-conditioning system may be designed by an installing air-conditioning contractor certified under Chapter 489, *Florida Statutes*, to serve any building or addition which is designed to accommodate fewer than 100 persons and requires an air-conditioning system with a value of \$50,000 or less; and when a 15-ton-per system or less is designed for a singular space of a building and each 15-ton system or less has an independent duct system. Systems not complying with the above require design documents that are to be sealed by a professional engineer.

Example 1: When a space has two 10-ton systems with each having an independent duct system, the contractor may design these two systems since each unit (system) is less than 15 tons.

Example 2: Consider a small single-story office building which consists of six individual offices where each

office has a single 3-ton package air conditioning heat pump. The six heat pumps are connected to a single water cooling tower. The cost of the entire heating, ventilation and air-conditioning work is \$47,000 and the office building accommodates fewer than 100 persons. Because the six mechanical units are connected to a common water tower this is considered to be an 18-ton system. It therefore could not be designed by a mechanical or air conditioning contractor.

NOTE: It was further clarified by the Commission that the limiting criteria of 100 persons and \$50,000 apply to the building occupancy load and the cost for the total air-conditioning system of the building.

4. Any specialized mechanical, electrical, or plumbing document for any new building or addition which includes a medical gas, oxygen, steam, vacuum, toxic air filtration, halon, or fire detection and alarm system which costs more than \$5,000.

Documents requiring an engineer seal by this part shall not be valid unless a professional engineer who possesses a valid certificate of registration has signed, dated, and stamped such document as provided in Section 471.025, *Florida Statutes*.

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.

105.3.3 An enforcing authority may not issue a building permit for any building construction, erection, alteration, modification, repair or addition unless the permit either includes on its face or there is attached to the permit the following statement: "NOTICE: In addition to the requirements of this permit, there may be additional restrictions applicable to this property that may be found in the public records of this county, and there may be additional permits required from other governmental entities such as water management districts, state agencies or federal agencies."

105.3.4 A building permit for a single-family residential dwelling must be issued within 30 working days of application therefor unless unusual circumstances require a longer time for processing the application or unless the permit application fails to satisfy the *Florida Building Code* or the enforcing agency's laws or ordinances.

105.3.5 Identification of minimum premium policy. Except as otherwise provided in Chapter 440, *Florida Statutes*, Workers' Compensation, every employer shall, as a condition to receiving a building permit, show proof that it has secured compensation for its employees as provided in Section 440.10 and 440.38, *Florida Statutes*.

105.3.6 Asbestos removal. Moving, removal or disposal of asbestos-containing materials on a residential building where the owner occupies the building, the building is not for sale or lease, and the work is performed according to the

owner-builder limitations provided in this paragraph. To qualify for exemption under this paragraph, an owner must personally appear and sign the building permit application. The permitting agency shall provide the person with a disclosure statement in substantially the following form:

Disclosure Statement: State law requires asbestos abatement to be done by licensed contractors. You have applied for a permit under an exemption to that law. The exemption allows you, as the owner of your property, to act as your own asbestos abatement contractor even though you do not have a license. You must supervise the construction yourself. You may move, remove or dispose of asbestos-containing materials on a residential building where you occupy the building and the building is not for sale or lease, or the building is a farm outbuilding on your property. If you sell or lease such building within 1 year after the asbestos abatement is complete, the law will presume that you intended to sell or lease the property at the time the work was done, which is a violation of this exemption. You may not hire an unlicensed person as your contractor. Your work must be done according to all local, state and federal laws and regulations which apply to asbestos abatement projects. It is your responsibility to make sure that people employed by you have licenses required by state law and by county or municipal licensing ordinances.

105.4 Conditions of the permit.

105.4.1 Permit intent. A permit issued shall be construed to be a license to proceed with the work and not as authority to violate, cancel, alter or set aside any of the provisions of the technical codes, nor shall issuance of a permit prevent the building official from thereafter requiring a correction of errors in plans, construction or violations of this code. Every permit issued shall become invalid unless the work authorized by such permit is commenced within 6 months after its issuance, or if the work authorized by such permit is suspended or abandoned for a period of 6 months after the time the work is commenced.

105.4.1.1 If work has commenced and the permit is revoked, becomes null and void or expires because of lack of progress or abandonment, a new permit covering the proposed construction shall be obtained before proceeding with the work.

105.4.1.2 If a new permit is not obtained within 180 days from the date the initial permit became null and void, the building official is authorized to require that any work which has been commenced or completed be removed from the building site. Alternately, a new permit may be issued on application, providing the work in place and required to complete the structure meets all applicable regulations in effect at the time the initial permit became null and void and any regulations which may have become effective between the date of expiration and the date of issuance of the new permit.

105.4.1.3 Work shall be considered to be in active progress when the permit has received an approved inspection within 180 days. This provision shall not be applicable in case of civil commotion or strike or when the building work is halted due directly to judicial injunction, order or similar process.

105.4.1.4 The fee for renewal reissuance and extension of a permit shall be set forth by the administrative authority.

105.5 Expiration. Reserved.

105.6 Suspension or revocation. Reserved.

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.

105.8 Notice of commencement. As per Section 713.135, *Florida Statutes*, when any person applies for a building permit, the authority issuing such permit shall print on the face of each permit card in no less than 18-point, capitalized, bold-faced type: "WARNING TO OWNER: YOUR FAILURE TO RECORD A NOTICE OF COMMENCEMENT MAY RESULT IN YOUR PAYING TWICE FOR IMPROVEMENTS TO YOUR PROPERTY. IF YOU INTEND TO OBTAIN FINANCING, CONSULT WITH YOUR LENDER OR AN ATTORNEY BEFORE RECORDING YOUR NOTICE OF COMMENCEMENT."

105.9 Asbestos. The enforcing agency shall require each building permit for the demolition or renovation of an existing structure to contain an asbestos notification statement which indicates the owner's or operator's responsibility to comply with the provisions of Section 469.003, *Florida Statutes*, and to notify the Department of Environmental Protection of his or her intentions to remove asbestos, when applicable, in accordance with state and federal law.

105.10 Certificate of protective treatment for prevention of termites. A weather-resistant job-site posting board shall be provided to receive duplicate treatment certificates as each required protective treatment is completed, providing a copy for the person the permit is issued to and another copy for the building permit files. The treatment certificate shall provide the product used, identity of the applicator, time and date of the treatment, site location, area treated, chemical used, percent concentration and number of gallons used, to establish a verifiable record of protective treatment. If the soil chemical barrier method for termite prevention is used, final exterior treatment shall be completed prior to final building approval.

105.11 Notice of termite protection. A permanent sign which identifies the termite treatment provider and need for reinspection and treatment contract renewal shall be provided. The sign shall be posted near the water heater or electric panel.

105.12 Work starting before permit issuance. Upon approval of the building official, the scope of work delineated in the building permit application and plan may be started prior to the final approval and issuance of the permit, provided any

work completed is entirely at risk of the permit applicant and the work does not proceed past the first required inspection.

105.13 Phased permit approval. After submittal of the appropriate construction documents, 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. 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. Corrections may be required to meet the requirements of the technical codes.

105.14 Permit issued on basis of an affidavit. Whenever a permit is issued in reliance upon an affidavit or whenever the work to be covered by a permit involves installation under conditions which, in the opinion of the building official, are hazardous or complex, the building official shall require that the architect or engineer who signed the affidavit or prepared the drawings or computations shall supervise such work. In addition, they shall be responsible for conformity to the permit, provide copies of inspection reports as inspections are performed, and upon completion make and file with the building official written affidavit that the work has been done in conformity to the reviewed plans and with the structural provisions of the technical codes. In the event such architect or engineer is not available, the owner shall employ in his stead a competent person or agency whose qualifications are reviewed by the building official. The building official shall ensure that any person conducting plans review is qualified as a plans examiner under Part XII of Chapter 468, *Florida Statutes*, and that any person conducting inspections is qualified as a building inspector under Part III of Chapter 468, *Florida Statutes*.

SECTION 106 CONSTRUCTION DOCUMENTS

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

If the design professional is an architect or engineer legally registered under the laws of this state regulating the practice of architecture as provided for in Chapter 481, *Florida Statutes*, Part I, or engineering as provided for in Chapter 471, *Florida Statutes*, then he or she shall affix his or her official seal to said drawings, specifications and accompanying data, as required by *Florida Statute*. If the design professional is a landscape architect registered under the laws of this state regulating the

practice of landscape architecture as provided for in Chapter 481, *Florida Statutes*, Part II, then he or she shall affix his or her seal to said drawings, specifications and accompanying data as defined in Section 481.303(6)(a)(b)(c)(d), *FS*.

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 (see also Section 106.3.5).

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.

106.1.1.2 For roof assemblies required by the code, the construction documents shall illustrate, describe and delineate the type of roofing system, materials, fastening requirements, flashing requirements and wind resistance rating that are required to be installed. Product evaluation and installation shall indicate compliance with the wind criteria required for the specific site or a statement by an architect or engineer for the specific site must be submitted with the construction documents.

106.1.2 Means of egress. Reserved.

106.1.3 Exterior wall envelope. Reserved.

106.2 Site plan. Reserved.

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.

Exceptions:

1. Building plans approved pursuant to Section 553.77(5), *Florida Statutes*, and state-approved manufactured buildings are exempt from local codes enforcing agency plan reviews except for provisions of the code relating to erection, assembly or construction at the site. Erection, assembly and construction at the site are subject to local permitting and inspections.
2. Industrial construction on sites where design, construction and fire safety are supervised by appropriate design and inspection professionals and which contain adequate in-house fire departments and rescue squads is exempt, subject to local government option, from review of plans and inspections, providing owners certify that applicable codes and standards have been met and supply appropriate approved drawings to local building and fire-safety inspectors.

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.

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.

106.3.3 Phased approval. Reserved.

106.3.4 Design professional in responsible charge. Reserved.

106.3.4.1 General. Reserved.

106.3.4.2 Deferred submittals. Reserved.

106.3.4.3 Certifications by contractors authorized under the provisions of Section 489.115(4)(b), *Florida Statutes*, shall be considered equivalent to sealed plans and specifications by a person licensed under Chapter 471, *Florida Statutes*, or Chapter 481 *Florida Statutes*, by local enforcement agencies for plans review for permitting purposes relating to compliance with the wind-resistance provisions of the code or alternate methodologies approved by the Florida Building Commission for one- and two-family dwellings. Local enforcement agencies may rely upon such certification by contractors that the plans and specifications submitted conform to the requirements of the code for wind resistance. Upon good cause shown, local government code enforcement agencies may accept or reject plans sealed by persons licensed under Chapters 471, 481 or 489, *Florida Statutes*.

106.3.5 Minimum plan review criteria for buildings. The examination of the documents by the building official shall include the following minimum criteria and documents: a floor plan; site plan; foundation plan; floor/roof framing plan or truss layout; and all exterior elevations:

Commercial Buildings:

Building

1. Site requirements:
 - Parking
 - Fire access
 - Vehicle loading
 - Driving/turning radius
 - Fire hydrant/water supply/post indicator valve (PIV)
 - Set back/separation (assumed property lines)
 - Location of specific tanks, water lines and sewer lines
2. Occupancy group and special occupancy requirements shall be determined.

3. Minimum type of construction shall be determined (see Table 503).
4. Fire-resistant construction requirements shall include the following components:
 - Fire-resistant separations
 - Fire-resistant protection for type of construction
 - Protection of openings and penetrations of rated walls
 - Fire blocking and draftstopping and calculated fire resistance
5. Fire suppression systems shall include:
 - Early warning smoke evacuation systems
 - Schematic fire sprinklers
 - Standpipes
 - Preengineered systems
 - Riser diagram
 - Same as above
6. Life safety systems shall be determined and shall include the following requirements:
 - Occupant load and egress capacities
 - Early warning
 - Smoke control
 - Stair pressurization
 - Systems schematic
7. Occupancy load/egress requirements shall include:
 - Occupancy load
 - Gross
 - Net
 - Means of egress
 - Exit access
 - Exit
 - Exit discharge
 - Stairs construction/geometry and protection
 - Doors
 - Emergency lighting and exit signs
 - Specific occupancy requirements
 - Construction requirements
 - Horizontal exits/exit passageways
8. Structural requirements shall include:
 - Soil conditions/analysis
 - Termite protection
 - Design loads
 - Wind requirements
 - Building envelope
 - Structural calculations (if required)
 - Foundation
 - Wall systems
 - Floor systems
 - Roof systems
 - Threshold inspection plan
 - Stair systems
9. Materials shall be reviewed and shall at a minimum include the following:
 - Wood
 - Steel
 - Aluminum
 - Concrete
 - Plastic
 - Glass

Masonry
Gypsum board and plaster
Insulating (mechanical)
Roofing
Insulation

10. Accessibility requirements shall include the following:
 - Site requirements
 - Accessible route
 - Vertical accessibility
 - Toilet and bathing facilities
 - Drinking fountains
 - Equipment
 - Special occupancy requirements
 - Fair housing requirements
11. Interior requirements shall include the following:
 - Interior finishes (flame spread/smoke development)
 - Light and ventilation
 - Sanitation
12. Special systems:
 - Elevators
 - Escalators
 - Lifts
13. Swimming pools:
 - Barrier requirements
 - Spas
 - Wading pools

Electrical

1. Electrical:
 - Wiring
 - Services
 - Feeders and branch circuits
 - Overcurrent protection
 - Grounding
 - Wiring methods and materials
 - GFCIs
2. Equipment
3. Special occupancies
4. Emergency systems
5. Communication systems
6. Low voltage
7. Load calculations

Plumbing

1. Minimum plumbing facilities
2. Fixture requirements
3. Water supply piping
4. Sanitary drainage
5. Water heaters
6. Vents
7. Roof drainage
8. Back flow prevention
9. Irrigation

10. Location of water supply line
11. Grease traps
12. Environmental requirements
13. Plumbing riser

Mechanical

1. Energy calculations
2. Exhaust systems:
 - Clothes dryer exhaust
 - Kitchen equipment exhaust
 - Specialty exhaust systems
3. Equipment
4. Equipment location
5. Make-up air
6. Roof-mounted equipment
7. Duct systems
8. Ventilation
9. Combustion air
10. Chimneys, fireplaces and vents
11. Appliances
12. Boilers
13. Refrigeration
14. Bathroom ventilation
15. Laboratory

Gas

1. Gas piping
2. Venting
3. Combustion air
4. Chimneys and vents
5. Appliances
6. Type of gas
7. Fireplaces
8. LP tank location
9. Riser diagram/shutoffs

Demolition

1. Asbestos removal

Residential (one- and two-family)

1. Site requirements
 - Set back/separation (assumed property lines)
 - Location of septic tanks
2. Fire-resistant construction (if required)
3. Fire
4. Smoke detector locations
5. Egress
 - Egress window size and location
 - stairs construction requirements

6. Structural requirements shall include:
Wall section from foundation through roof, including assembly and materials connector tables wind requirements structural calculations (if required)
7. Accessibility requirements: show/identify accessible bath

Exemptions.

Plans examination by the building official shall not be required for the following work:

1. Replacing existing equipment such as mechanical units, water heaters, etc.
2. Reroofs
3. Minor electrical, plumbing and mechanical repairs
4. Annual maintenance permits
5. Prototype plans
Except for local site adaptations, siding, foundations and/or modifications.
Except for structures that require waiver.
6. Manufactured buildings plan except for foundations and modifications of buildings on site.

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.

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 *Florida Statutes*.

106.6 Affidavits. The building official may accept a sworn affidavit from a registered architect or engineer stating that the plans submitted conform to the technical codes. For buildings and structures, the affidavit shall state that the plans conform to the laws as to egress, type of construction and general arrangement and, if accompanied by drawings, show the structural design and that the plans and design conform to the requirements of the technical codes as to strength, stresses, strains, loads and stability. The building official may without any examination or inspection accept such affidavit, provided the architect or engineer who made such affidavit agrees to submit to the building official copies of inspection reports as inspections are performed and upon completion of the structure, electrical, gas, mechanical or plumbing systems a certification that the structure, electrical, gas, mechanical or plumbing system has been erected in accordance with the requirements of the technical codes. Where the building official relies upon such affidavit, the architect or engineer shall assume full responsibility for compliance with all provisions of the technical codes and other pertinent laws or ordinances. The building official shall ensure that any person conducting plans review is qualified as a plans examiner under Part XII of Chapter 468, *Florida Statutes*, and that any person conducting inspections is

qualified as a building inspector under Part XII of Chapter 468, *Florida Statutes*.

**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.

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.

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 Chapter 27 of the *Florida Building Code, 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.

**SECTION 108
FEES**

108.1 Prescribed fees. A permit shall not be issued until fees authorized under Section 553.80, *Florida Statutes*, have been paid. Nor shall an amendment to a permit be released until the additional fee, if any, due to an increase in the estimated cost of the building, structure, electrical, plumbing, mechanical or gas systems has been paid.

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.

108.3 Building permit valuations. Reserved.

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 building official's approval or the necessary permits shall be subject to a penalty of 100 percent of the usual permit fee in addition to the required permit fees.

108.5 Related fees. Reserved.

108.6 Refunds. Reserved.

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.

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.

109.3 Required inspections. The building official upon notification from the permit holder or his or her agent, shall make the following inspections, and shall either release that portion of the construction or shall notify the permit holder or his or her agent of any violations which must be corrected in order to comply with the technical codes. The building official shall determine the timing and sequencing of when inspections occur and what elements are inspected at each inspection.

Building

1. Foundation inspection. To be made after trenches are excavated and forms erected and shall at a minimum include the following building components:

- Stem-wall
- Monolithic slab-on-grade
- Piling/pile caps
- Footers/grade beams

2. Framing inspection. To be made after the roof, all framing, fireblocking and bracing is in place, all concealed wiring, all pipes, chimneys, ducts and vents are complete and shall at a minimum include the following building components:

- Window/door framing
- Vertical cells/columns
- Lintel/tie beams
- Framing/trusses/bracing/connectors
- Draft stopping/fire blocking
- Curtain wall framing
- Energy insulation
- Accessibility.
- Verify rough opening dimensions are within tolerances.

3. Sheathing inspection. To be made either as part of a dry-in inspection or done separately at the request of the contractor after all roof and wall sheathing and fasteners are complete and shall at a minimum include the following building components:

- Roof sheathing

- Wall sheathing
- Sheathing fasteners
- Roof/wall dry-in.

4. Roofing inspection. Shall at a minimum include the following building components:

- Dry-in
- Insulation
- Roof coverings
- Flashing

5. Final inspection. To be made after the building is completed and ready for occupancy.

6. Swimming pool inspection. First inspection to be made after excavation and installation of reinforcing steel, bonding and main drain and prior to placing of concrete.

Final inspection to be made when the swimming pool is complete and all required enclosure requirements are in place.

In order to pass final inspection and receive a certificate of completion, a residential swimming pool must meet the requirements relating to pool safety features as described in Section 424.2.17.

7. Demolition inspections. First inspection to be made after all utility connections have been disconnected and secured in such manner that no unsafe or unsanitary conditions shall exist during or after demolition operations.

Final inspection to be made after all demolition work is completed.

8. Manufactured building inspections. The building department shall inspect construction of foundations; connecting buildings to foundations; installation of parts identified on plans as site installed items, joining the modules, including utility crossovers; utility connections from the building to utility lines on site; and any other work done on site which requires compliance with the *Florida Building Code*. Additional inspections may be required for public educational facilities (see Section 423.27.20).

9. Where impact-resistant coverings are installed to meet requirements of this code, the building official shall schedule adequate inspections of impact-resistant coverings to determine the following:

The system indicated on the plans was installed.

The system is installed in accordance with the manufacturer's installation instructions and the product approval.

Electrical

1. Underground inspection. To be made after trenches or ditches are excavated, conduit or cable is installed, and before any backfill is put in place.

2. Rough-in inspection. To be made after the roof, framing, fireblocking and bracing is in place and prior to the installation of wall or ceiling membranes.

3. Final inspection. To be made after the building is complete, all required electrical fixtures are in place and properly connected or protected, and the structure is ready for occupancy.

Plumbing

1. Underground inspection. To be made after trenches or ditches are excavated, piping is installed, and before any backfill is put in place.
2. Rough-in inspection. To be made after the roof, framing, fireblocking and bracing is in place and all soil, waste and vent piping is complete, and prior to this installation of wall or ceiling membranes.
3. Final inspection. To be made after the building is complete, all plumbing fixtures are in place and properly connected, and the structure is ready for occupancy.

Note: See Section 312 of the *Florida Building Code, Plumbing* for required tests.

Mechanical

1. Underground inspection. To be made after trenches or ditches are excavated, underground duct and fuel piping is installed, and before any backfill is put in place.
2. Rough-in inspection. To be made after the roof, framing, fire blocking and bracing are in place and all ducting, and other concealed components are complete, and prior to the installation of wall or ceiling membranes.
3. Final inspection. To be made after the building is complete, the mechanical system is in place and properly connected, and the structure is ready for occupancy.

Gas

1. Rough piping inspection. To be made after all new piping authorized by the permit has been installed, and before any such piping has been covered or concealed or any fixtures or gas appliances have been connected.
2. Final piping inspection. To be made after all piping authorized by the permit has been installed and after all portions which are to be concealed by plastering or otherwise have been so concealed, and before any fixtures or gas appliances have been connected. This inspection shall include a pressure test.
3. Final inspection. To be made on all new gas work authorized by the permit and such portions of existing systems as may be affected by new work or any changes, to ensure compliance with all the requirements of this code and to assure that the installation and construction of the gas system is in accordance with reviewed plans.

109.3.1 Footing and foundation inspection. Reserved.

109.3.2 Concrete slab and under-floor inspection. Reserved.

109.3.3 Reinforcing steel and structural frames. Reinforcing steel or structural frame work of any part of any building or structure shall not be covered or concealed without first obtaining a release from the building official.

109.3.4 Termites. Building components and building surroundings required to be protected from termite damage in accordance with Section 1503.6, Section 2304.13 or Section 2304.11.6, specifically required to be inspected for termites in accordance with Section 2114, or required to have chemical soil treatment in accordance with Section 1816

shall not be covered or concealed until the release from the building official has been received.

109.3.5 Shoring. For threshold buildings, shoring and associated formwork or falsework shall be designed and inspected by a Florida licensed professional engineer, employed by the permit holder or subcontractor, prior to any required mandatory inspections by the threshold building inspector.

109.3.6 Threshold building.

109.3.6.1 The enforcing agency shall require a special inspector to perform structural inspections on a threshold building pursuant to a structural inspection plan prepared by the engineer or architect of record. The structural inspection plan must be submitted to the enforcing agency prior to the issuance of a building permit for the construction of a threshold building. The purpose of the structural inspection plans is to provide specific inspection procedures and schedules so that the building can be adequately inspected for compliance with the permitted documents. The special inspector may not serve as a surrogate in carrying out the responsibilities of the building official, the architect or the engineer of record. The contractor's contractual or statutory obligations are not relieved by any action of the special inspector.

109.3.6.2 The special inspector shall determine that a professional engineer who specializes in shoring design has inspected the shoring and reshoring for conformance with the shoring and reshoring plans submitted to the enforcing agency. A fee simple title owner of a building, which does not meet the minimum size, height, occupancy, occupancy classification or number-of-stories criteria which would result in classification as a threshold building under s. 553.71(7), may designate such building as a threshold building, subject to more than the minimum number of inspections required by the *Florida Building Code*.

109.3.6.3 The fee owner of a threshold building shall select and pay all costs of employing a special inspector, but the special inspector shall be responsible to the enforcement agency. The inspector shall be a person certified, licensed or registered under Chapter 471, *Florida Statutes*, as an engineer or under Chapter 481, *Florida Statutes*, as an architect.

109.3.6.4 Each enforcement agency shall require that, on every threshold building:

109.3.6.4.1 The special inspector, upon completion of the building and prior to the issuance of a certificate of occupancy, file a signed and sealed statement with the enforcement agency in substantially the following form: "To the best of my knowledge and belief, the above described construction of all structural load-bearing components complies with the permitted documents, and the shoring and reshoring conforms to the shoring and reshoring plans submitted to the enforcement agency."

109.3.6.4.2 Any proposal to install an alternate structural product or system to which building codes apply be submitted to the enforcement agency for review for compliance with the codes and made part of the enforcement agency's recorded set of permit documents.

109.3.6.4.3 All shoring and reshoring procedures, plans and details be submitted to the enforcement agency for recordkeeping. Each shoring and reshoring installation shall be supervised, inspected and certified to be in compliance with the shoring documents by the contractor.

109.3.6.4.4 All plans for the building which are required to be signed and sealed by the architect or engineer of record contain a statement that, to the best of the architect's or engineer's knowledge, the plans and specifications comply with the applicable minimum building codes and the applicable fire-safety standards as determined by the local authority in accordance with this section and Chapter 633, *Florida Statutes*.

109.3.6.5 No enforcing agency may issue a building permit for construction of any threshold building except to a licensed general contractor, as defined in Section 489.105(3)(a), *Florida Statutes*, or to a licensed building contractor, as defined in Section 489.105(3)(b), *Florida Statutes*, within the scope of her or his license. The named contractor to whom the building permit is issued shall have the responsibility for supervision, direction, management and control of the construction activities on the project for which the building permit was issued.

109.3.6.6 The building department may allow a special inspector to conduct the minimum structural inspection of threshold buildings required by this code, Section 553.73, *Florida Statutes*, without duplicative inspection by the building department. The building official is responsible for ensuring that any person conducting inspections is qualified as a building inspector under Part XII of Chapter 468, *Florida Statutes*, or certified as a special inspector under Chapter 471 or 481, *Florida Statutes*. Inspections of threshold buildings required by Section 553.79(5), *Florida Statutes*, are in addition to the minimum inspections required by this code.

109.3.7 Energy efficiency inspections. Reserved.

109.3.8 Other inspections. Reserved.

109.3.9 Special inspections. Reserved.

109.3.10 Final inspection. Reserved.

109.4 Inspection agencies. Reserved.

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.

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.

SECTION 110 CERTIFICATES OF OCCUPANCY AND COMPLETION

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.

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.

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.

110.4 Certificate of Completion. A Certificate of Completion is proof that a structure or system is complete and for certain

types of permits is released for use and may be connected to a utility system. This certificate does not grant authority to occupy a building, such as shell building, prior to the issuance of a Certificate of Occupancy.

110.5 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.

**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.

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.

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.

**SECTION 112
BOARD OF APPEALS
RESERVED**

**SECTION 113
VIOLATIONS
RESERVED**

**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.

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.

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.

**SECTION 115
UNSAFE STRUCTURES AND EQUIPMENT
RESERVED**

BUILDING CODE

DRAFT

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CHAPTER 2 DEFINITIONS

SECTION 201 GENERAL

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.

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.

201.3 Words not defined. Words not defined herein shall have the meanings stated in the *Florida Building Code, Plumbing, Mechanical and Fuel Gas*, or the *Florida Fire Prevention Code*. Words not defined in the Florida Building Codes shall have the meanings in *Webster's Third New International Dictionary of the English Language, Unabridged*.

201.4 Terms not defined. Reserved.

SECTION 202 DEFINITIONS

AAC MASONRY. See Section 2102.1.

ACCESSIBLE. See Section 11-3.5.

ACCESSIBLE MEANS OF EGRESS. See Section 1002.1.

ACCESSIBLE ROUTE. See Section 11-3.5.

ACCESSIBLE UNIT. Reserved.

ACCREDITATION BODY. See Section 2302.1.

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

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, live-stock 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.

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.

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.

APPLICABLE GOVERNING BODY. A city, county, state, state agency or other political government subdivision or entity authorized to administer and enforce the provisions of this code, as adopted or amended. Also applies to administrative authority.

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

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.

ARCHITECT. A Florida-registered architect.

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.

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

ATRIUM. See Section 404.1.1.

DEFINITIONS

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

[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. Any rigid or movable (retractable) roof-like structure, cantilevered, or otherwise entirely supported from a building. An awning is comprised of a lightweight rigid or removable skeleton structure over which an approved cover is attached.

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. Reserved.

BASE FLOOD ELEVATION. Reserved.

BASEMENT. See Sections 502.1.

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.

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

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

BUILT-UP ROOF COVERING. See Section 1502.1.

BURIAL CHAMBER MAUSOLEUM. A family mausoleum consisting of 6 or fewer casket placement crypts plus a chamber to be used for loading of caskets from the interior of the mausoleum which is not below the level of the ground and which is substantially exposed above ground.

BUTTRESS. See Section 2102.1.

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

CANOPY. Any fixed roof-like structure, not movable like an awning, and which is cantilevered in whole or in part self-supporting, but having no side walls or curtains other than valances not more than 18 inches (457 mm) deep. Lean-to canopies, fixed umbrellas and similar structures are included in this classification. Structures having side walls or valances more than 18 inches (457 mm) deep shall be classified as a tent as set forth herein.

[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.

CHAPEL MAUSOLEUM. A mausoleum for the public that has heat or air conditioning, with or without a committal area or office.

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.

CIRCULAR STAIRS. See Section 1002.

CIRCULATION PATH. Reserved.

[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.

COLUMBARIUM. A permanent structure consisting of niches.

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.

COMMISSION. The Florida Building Commission.

COMMON PATH OF EGRESS TRAVEL. See Section 1002.1.

COMMON USE. Reserved.

COMPANION CRYPT. A permanent chamber in a mausoleum for the containment of human remains of more than one individual.

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 721.1.1.1.

CONCRETE, CELLULAR. See Section 721.1.1.1.

CONCRETE, LIGHTWEIGHT AGGREGATE. See Section 721.1.1.1.

CONCRETE, PERLITE. See Section 721.1.1.1.

CONCRETE, SAND-LIGHTWEIGHT. See Section 721.1.1.1.

CONCRETE, SILICEOUS AGGREGATE. See Section 721.1.1.1.

CONCRETE, VERMICULITE. See Section 721.1.1.1.

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.

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.

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.

[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.

COVER. See Section 2102.1.

COVERED MALL BUILDING. See Section 402.2.

CRANE LOAD. The dead, live and impact loads and forces resulting from the operation of permanent cranes.

CRIPPLE WALL. See Section 2302.1.

CRYOGENIC FLUID. See Section 307.2.

CRYPT. A permanent chamber in a mausoleum for the containment of human remains.

DALLE GLASS. See Section 2402.1.

DAMPER. See Section 702.1.

DAY BOX. See Section 307.2.

DAY-CARE HOME. A building or a portion of a building in which more than 3 but not more than 12 clients receive care, maintenance and supervision, by other than their relative(s) or legal guardian(s), for less than 24 hour per day.

DAY-CARE OCCUPANCY. A building or a portion of a building in which more than 12 clients receive care, maintenance and supervision, by other than their relative(s) or legal guardian(s), for less than 24 hour per day.

DEAD LOADS. See Section 1602.1.

DECK. See Section 1602.1.

DECORATIVE CEMENTITIOUS COATING. A skim coat, as defined in ASTM C 926, of portland cement based plaster applied to concrete or masonry surfaces intended for cosmetic purposes.

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.

[F] DEFLAGRATION. See Section 307.2.

[F] DELUGE SYSTEM. See Section 902.1.

DEFINITIONS

DESIGN DISPLACEMENT. See Section 1908.1.3.

DESIGN EARTHQUAKE GROUND MOTION. Reserved.

DESIGN FLOOD. Reserved.

DESIGN FLOOD ELEVATION. Reserved.

DESIGN STRENGTH. See Section 1602.1.

DESIGNATED SEISMIC SYSTEM. Reserved.

[F] DETACHED BUILDING. See Section 307.2.

DETAILED PLAIN CONCRETE STRUCTURAL WALL.
See Section 1908.1.3.

DETECTABLE WARNING. See Section 11-3.

[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. Reserved.

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.

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.

DWELLING UNIT OR SLEEPING UNIT, MULTI-STORY. Reserved.

DWELLING UNIT OR SLEEPING UNIT, TYPE A.
Reserved.

DWELLING UNIT OR SLEEPING UNIT, TYPE B.
Reserved.

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. Reserved.

ENFORCEMENT AGENCY.

Local enforcement agency. Means an agency of local government with authority to make inspections of buildings and to enforce the codes which establish standards for design, construction, erection, alteration, repair, modification or demolition of public or private buildings, structures or facilities.

State enforcement agency. Means the agency of state government with authority to make inspections of buildings and to enforce the codes, as required by this part, which establish standards for design, construction, erection, alteration, repair, modification or demolition of public or private buildings, structures or facilities.

ENGINEER. A Florida-licensed professional engineer.

EQUIPMENT PLATFORM. See Section 502.1.

ESSENTIAL FACILITIES. See Section 1602.1.

[F] EXHAUSTED ENCLOSURE. See Section 415.2.

EXISTING CONSTRUCTION. Reserved.

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.

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 COVERED FRAMEWORK (FCF). A nonpressurized structure which is composed of a rigid framework to support tensioned membrane or fabric which provides the weather barrier.

FABRIC PARTITIONS. See Section 1602.1.

FABRICATED ITEM. See Section 1702.1.

[F] FABRICATION AREA. See Section 415.2.

[F] FACILITY. See Section 11-3.5.

FACTORED LOAD. See Section 1602.1.

FAMILY DAY CARE HOME. Family day care home means an occupied residence in which child care is regularly provided for at least two unrelated families which receive payment, fee, or grant for any of the children receiving care, whether or not operated for profit. A family day care home shall be allowed to care for one of the following groups of children, which shall include those children under 13 years of age who are related to the care giver: A. A maximum of four children from birth to 12 months of age. B. A maximum of three children to birth to 12 years of age and other children for maximum total of six children. C. A maximum of six preschool children if all are older than 12 months of age. D. A maximum of 10 children if no more than five are preschool age and, of those five, no more than two are under 12 months of age.

FAMILY MAUSOLEUM. A mausoleum for the private use of a family or group of family members.

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.

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.

FLEXIBLE PLAN BUILDINGS. Buildings used for day-care homes which have movable corridor walls and movable partitions of full-height construction with doors leading from rooms to corridors.

FLEXURAL LENGTH. See Section 1808.1.

FLOATING RESIDENTIAL UNIT. Means a structure primarily designed or constructed as a living unit, built on a floating base, which is not designed primarily as a vessel, is not self-propelled although it may be towed about from place to place, and is primarily intended to be anchored or otherwise moored in a fixed location.

FLOOD OR FLOODING. Reserved.

FLOOD DAMAGE-RESISTANT MATERIALS. Reserved.

FLOOD HAZARD AREA. Reserved.

FLOOD HAZARD AREA SUBJECT TO HIGH VELOCITY WAVE ACTION. Reserved.

DEFINITIONS

FLOOD INSURANCE RATE MAP (FIRM). Reserved.

FLOOD INSURANCE STUDY. Reserved.

FLOODWAY. Reserved.

FLOOR AREA, GROSS. See Section 1002.1.

FLOOR AREA, NET. See Section 1002.1.

FLOOR FIRE DOOR ASSEMBLY. A combination of a fire door, a frame, hardware and other accessories, installed in a horizontal plane, which together provide a specific degree of fire protection to a through opening in a fire rated floor.

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.

FRAMEWORK. A skeletal or structural frame; an openwork frame structure.

GARDEN MAUSOLEUM. A mausoleum for the public built without heat or air conditioning but may contain an open-air committal area.

[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.

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.

GROUP DAY CARE HOME. A day care home in which at least 7 but not more than 12 client receive care, maintenance and supervision by other than their relative(s) or legal guardian(s) for less than 24 hours per day with no more than 3 clients incapable of self-preservation.

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 structure for living, sleeping, eating or cooking. Bathrooms, toilet compartments, closets, halls, screen enclosures, sunroom Categories I, II and III as defined in the AAMA/NPEA/NSA 2100, storage or utility space and similar areas are not considered habitable space.

[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.

HEATING. See Chapter 28 of the *Florida Building Code, Building* and the *Florida Building Code, Mechanical*.

HEIGHT, BUILDING. See Section 502.1.

HEIGHT, STORY. See Section 502.1.

HEIGHT, THRESHOLD BUILDING. The height of the building is at the mean distance between the eaves and the ridge of the roofing structure. If the distance from grade to the line which is the mean distance between the eaves and the ridge of the roofing structure is more than 50 feet, the building is to be considered a “threshold building” within the contemplation of the Threshold Building Act.

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.

HIGH VELOCITY HURRICANE ZONE. This zone consists of Broward and Miami-Dade counties.

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 Chapter 11 of the *Florida Existing Building Code*).

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.

INSULATING CONCRETE FORM (ICF). A concrete forming system using stay-in-place forms of rigid foam plastic insulation, a hybrid of cement and foam insulation, a hybrid of cement and wood chips, or other insulating material for constructing cast-in-place concrete walls.

INTENDED TO BE OCCUPIED AS A RESIDENCE. Reserved.

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.

LABEL. See Section 1702.1.

LANDSCAPE ARCHITECT. A Florida-registered landscape architect.

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.

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.

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

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

LOWEST FLOOR. Reserved.

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.

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.

MATERIAL CODE VIOLATION. A material code violation is a violation that exists within a completed building, structure or facility which may reasonably result, or has resulted, in physical harm to a person or significant damage to the performance of a building or its systems.

MATERIAL VIOLATION. As defined in *Florida Statutes*.

MAUSOLEUM. A permanent structure or building which is substantially exposed above the ground and is intended for the interment, entombment, or inurnment of human remains.

MAXIMUM CONSIDERED EARTHQUAKE GROUND MOTION. Reserved.

MEAN DAILY TEMPERATURE. See Section 2102.1.

MEANS OF EGRESS. See Section 1002.1.

MEANS OF ESCAPE. See Section 1002.

MECHANICAL-ACCESS OPEN PARKING GARAGES. See Section 406.3.2.

MECHANICAL EQUIPMENT SCREEN. See Section 1502.1.

MECHANICAL SYSTEMS. Reserved.

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.

DEFINITIONS

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. Reserved.

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

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

MULTISTORY UNITS. Reserved.

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.

NICHE. A permanent chamber in a columbarium or mausoleum to hold the cremated remains of one or more individuals.

NOMINAL LOADS. See Section 1602.1.

NOMINAL SIZE (LUMBER). See Section 2302.1.

NONCOMBUSTIBLE MEMBRANE STRUCTURE. See Section 3102.2.

NONVISITATION CRYPT MAUSOLEUM. A mausoleum for the public where the crypts are not accessible to the public.

[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.

OPEN PARKING GARAGE. See Section 406.3.2.

OPEN PLAN BUILDINGS. Buildings used for day-care homes which have rooms and corridors delineated by tables, chairs, desks, bookcases, counters, low-height [maximum 5-ft (1.5-m)] partitions, or similar furnishings.

[F] OPEN SYSTEM. See Section 307.2.

OPENINGS. Apertures or holes in a building envelope and which are designed as “open” during design winds as defined by these provisions.

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. Reserved.

OTHER STRUCTURES. See Section 1602.1.

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

[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.

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.

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.

PLANS. All construction drawings and specifications for any structure necessary for the building official to review in order to determine whether a proposed structure, addition or renovation will meet the requirements of this code and other applicable codes.

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. Reserved.

PUBLIC-USE AREAS. Reserved.

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.

REGISTERED TERMITICIDE. Product listed as registered for use as a preventative treatment for termites for new

construction by the Florida Department of Agriculture and Consumer Services under authority of Chapter 487, *Florida Statutes*.

REINFORCED PLASTIC, GLASS FIBER. See Section 2602.1.

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

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

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.

RESIDENT SLEEPING UNIT. A single unit providing sleeping facilities for one or more persons. Resident sleeping units can also include permanent provisions for living, eating and sanitation, but do not include kitchen facilities.

RESISTANCE FACTOR. See Section 1602.1.

RESTRICTED ENTRANCE. Reserved.

RETAINING WALL, SEGMENTAL. A retaining wall formed of modular block units stacked dry without mortar.

RETRACTABLE AWNING. Reserved.

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.

SCREEN ENCLOSURE. A building or part thereof, in whole or in part self-supporting, and having walls of insect screening with or without removable vinyl or acrylic wind break panels and a roof of insect screening, plastic, aluminum or similar lightweight material.

SCUPPER. See Section 1502.1.

SEISMIC DESIGN CATEGORY. Reserved.

SEISMIC-FORCE-RESISTING SYSTEM. Reserved.

DEFINITIONS

SELF-CLOSING. See Section 702.1.

SELF-PRESERVATION. A client who is capable of self-preservation is one who can evacuate the building without direct intervention by a staff member.

SELF-SERVICE STORAGE FACILITY. Reserved.

SEPARATE ATMOSPHERE. The atmosphere that exists between rooms, spaces, or areas that are separated by an approved smoke barrier.

[F] SERVICE CORRIDOR. See Section 415.2.

SERVICE ENTRANCE. Reserved.

SHAFT. See Section 702.1.

SHAFT ENCLOSURE. See Section 702.1.

SHEAR WALL. A wall designed to resist lateral forces parallel to the plane of the wall.

SHELL. See Section 2102.1.

SINGLE-PLY MEMBRANE. See Section 1502.1.

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

SITE. Reserved.

SITE CLASS. Reserved.

SITE COEFFICIENTS. Reserved.

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.

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.

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.

[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 AMUSEMENT BUILDING. See Section 411.2.

SPECIAL INSPECTION. Reserved.

Special inspection, continuous. Reserved.

Special inspection, periodic. Reserved.

SPECIAL FLOOD HAZARD AREA. Reserved.

SPECIFIED. See Section 2102.1.

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

SPIRAL STAIRS. A stairway with steps that have a central connecting point, and the travel path is a corkscrew or spiral.

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. Reserved.

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).

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.

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.

STREET. Any public thoroughfare, street, avenue, boulevard or space more than 20 feet (6096 mm) wide which has been dedicated or deeded for vehicular use by the public and which can be used for access by fire department vehicles.

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. Reserved.

STRUCTURE. That which is built or constructed.

SUBDIAPHRAGM. See Section 2302.1.

SUBSTANTIAL DAMAGE. Reserved.

SUBSTANTIAL IMPROVEMENT. See Section 3109.1.

SUNROOM. A one-story structure added to an existing dwelling with an open or glazed area in excess of 40 percent of the gross area of the sunroom structure's exterior walls and roof. For the purposes of this code the term "sunroom" as used herein, shall include conservatories, sun spaces, solariums, and porch or patio covers or enclosures.

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 424.2.1.

T RATING. See Section 702.1.

TECHNICALLY INFEASIBLE. Reserved.

TENANT. Any person, agent, firm, corporation or division who uses or occupies land, a building or portion of a building by title, under a lease, by payment of rent or who exercises limited control over the space.

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.

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.

THRESHOLD BUILDING. In accordance with *Florida Statute*, any building which is greater than three stories or 50 feet in height, or which has an assembly occupancy classification that exceeds 5,000 square feet in area and an occupant content of greater than 500 persons.

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.

[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. Reserved.

TYPE B UNIT. Reserved.

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.

VALUE. The estimated current replacement cost of the building in kind.

VAPOR-PERMEABLE MEMBRANE. A material or covering having a permeance rating of 5 perms (52.9×10^{-10} kg/Pa · s · m²) 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.

VAPOR RETARDER. A vapor-resistant material, membrane or covering such as foil, plastic sheeting or insulation facing having a permeance rating of 1 perm (5.7×10^{-11} kg/Pa · s · m²) or less, when tested in accordance with the desiccant method using Procedure A of ASTM E 96. Vapor retarders limit the

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amount of moisture vapor that passes through a material or wall assembly.

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.

VINYL SIDING. See Section 1402.1.

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

WALKWAY, COVERED. A roofed, unobstructed walkway connecting buildings and used as a means of travel by persons and where less than 50 percent of the perimeter is enclosed and the maximum width perpendicular to the direction of travel is less than 30 feet (9144 mm).

WALKWAY, ENCLOSED. A roofed, unobstructed walkway connecting buildings and used as a means of travel by persons and where 50 percent or more of the perimeter is enclosed and the maximum width perpendicular to the direction of travel is less than 30 feet (9144 mm).

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

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.

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

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. Reserved.

WIND-BORNE DEBRIS IMPACT RESISTANT PRODUCTS. Those products meeting TAS 201, TAS 202 and TAS 203, ASTM E 1886 or ASTM E 1996 or AAMA 506, SSTD 12, or ANSI/DASMA 115.

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.

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.

[F] ZONE. See Section 902.1.

CHAPTER 3

USE AND OCCUPANCY CLASSIFICATION

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.

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. Structures with multiple uses shall comply with Section 302.3. 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, F-2 and F-3.
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 and I-3
7. Mercantile (see Section 309): Group M
8. Residential (see Section 310): Groups R-1, R-2, R-3 as applicable in Section 101.2, and R-4
9. Storage (see Section 311): Groups S-1 and S-2
10. Utility and Miscellaneous (see Section 312): Group U
11. Day care (see Section 313): Group D

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 m²) in area and is accessory 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

303.1.1 Restaurants and drinking establishments with an occupant load of less than 50 persons shall be classified as Group M, mercantile.

**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

304.2 Sections 423(1) and 423(2) are applicable to community colleges.

**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.

305.2 Public education occupancies shall comply with Section 423.

**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.

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)

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)

306.4 Special purpose F-3. Factory-industrial occupancy includes industrial operations in buildings designed for and suitable only for particular types of operations, characterized by a relatively low density of employee population, with much of the area occupied by machinery or equipment. Group F-3 special purpose factory-industrial occupancy shall include, among others, the occupancies listed in this section: steel mills, paper plants and generating plants.

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 *Florida Fire Prevention 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 *Florida Fire Prevention 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 *Florida Fire Prevention Code*.
4. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *Florida Fire Prevention Code*.
5. Closed piping system 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 *Florida Building Code, Mechanical*.
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 *Florida Fire Prevention 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 *Florida Fire Prevention Code*.
16. Mercantile occupancies offering for retail sale sparklers, novelties and trick noisemakers as defined in Section 791.01, *Florida Statutes*, and that are not defined as fireworks by Chapter 791, *Florida Statutes*. Storage of sparklers and other novelties or trick noisemakers as defined in Chapter 791, *Florida Statutes*, within mercantile occupancies shall be in accordance with Section 791.055, *Florida Statutes*.

307.1.1 Hazardous materials. Hazardous materials in any quantity shall conform to the requirements of this code, including Section 414, and the *Florida Fire Prevention 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.

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.

[F] TABLE 307.1(1) MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD^{a, j, m, n, p}

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE ^b			USE-CLOSED SYSTEMS ^b			USE-OPEN SYSTEMS ^b		
			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)
Combustible liquid ^{c, i}	II	H-2 or H-3	N/A	120 ^{d, e}	N/A	N/A	N/A	120 ^d	30 ^d	N/A	30 ^d
	IIIA	H-2 or H-3	N/A	330 ^{d, e}	N/A	N/A	N/A	330 ^d	80 ^d	N/A	80 ^d
	IIIB	N/A	N/A	13,200 ^{e, f}	N/A	N/A	N/A	13,200 ^f	3,300 ^f	N/A	3,300 ^f
Combustible fiber	Loose baled ^o	H-3	(100) (1,000)	N/A	N/A	(100) (1,000)	N/A	N/A	(20) (200)	N/A	N/A
Consumer fireworks (Class C, Common)	1.4G	H-3	125 ^{d, e, 1}	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 ^d	N/A	N/A	N/A	45 ^d	N/A	N/A	10 ^d
	N/A	H-3	N/A	45 ^d	N/A	N/A	N/A	45 ^d	N/A	N/A	10 ^d
Explosives	Division 1.1	H-1	1 ^{c, g}	(1) ^{c, g}	N/A	0.25 ^g	N/A	(0.25) ^g	0.25 ^g	N/A	(0.25) ^g
	Division 1.2	H-1	1 ^{c, g}	(1) ^{c, g}	N/A	0.25 ^g	N/A	(0.25) ^g	0.25 ^g	N/A	(0.25) ^g
	Division 1.3	H-1 or 2	5 ^{c, g}	(5) ^{c, g}	N/A	1 ^g	N/A	(1) ^g	1 ^g	N/A	(1) ^g
	Division 1.4	H-3	50 ^{c, g}	(50) ^{c, g}	N/A	50 ^g	N/A	(50) ^g	N/A	N/A	N/A
	Division 1.4G	H-3	125 ^{d, e, 1}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Division 1.5	H-1	1 ^{c, g}	(1) ^{c, g}	N/A	0.25 ^g	N/A	(0.25) ^g	0.25 ^g	N/A	(0.25) ^g
Division 1.6	H-1	H-1	1 ^{d, e, g}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flammable gas	Gaseous liquefied	H-2	N/A	N/A	1,000 ^{d, e}	N/A	N/A	1,000 ^{d, e}	N/A	N/A	N/A
Flammable liquid ^c	1A and 1C	H-2 or H-3	N/A	30 ^{d, e}	N/A	N/A	N/A	30 ^{d, e}	N/A	N/A	10 ^d 30 ^d
	N/A	H-2 or H-3	N/A	30 ^{d, e}	N/A	N/A	N/A	30 ^d	N/A	N/A	30 ^{d, h}
Combination flammable liquid (1A, 1B, 1C)	N/A	H-2 or H-3	N/A	120 ^{d, e, h}	N/A	N/A	N/A	120 ^{d, h}	N/A	N/A	30 ^{d, h}
	N/A	H-3	125 ^{d, e}	N/A	N/A	125 ^d	N/A	N/A	25 ^d	N/A	N/A
Organic peroxide	UD	H-1	1 ^{c, g}	(1) ^{c, g}	N/A	0.25 ^g	N/A	(0.25) ^g	0.25 ^g	N/A	(0.25) ^g
	I	H-2	5 ^{d, e}	(5) ^{d, e}	N/A	1 ^d	N/A	(1) ^d	1 ^d	N/A	(1) ^d
	II	H-3	50 ^{d, e}	(50) ^{d, e}	N/A	50 ^d	N/A	(50) ^d	10 ^d	N/A	(10) ^d
	III	H-3	125 ^{d, e}	(125) ^{d, e}	N/A	125 ^d	N/A	(125) ^d	25 ^d	N/A	(25) ^d
	IV	N/A	N/A	NL	NL	N/A	N/L	N/L	N/L	NL	NL
Oxidizer	V	N/A	NL	NL	N/A	N/L	N/L	N/L	NL	N/A	NL
	4	H-1	1 ^{c, g}	(1) ^{c, g}	N/A	0.25 ^g	N/A	(0.25) ^g	0.25 ^g	N/A	(0.25) ^g
	3 ^k	H-2 or H-3	10 ^{d, e}	(10) ^{d, e}	N/A	2 ^d	N/A	(2) ^d	2 ^d	N/A	(2) ^d
Oxidizing gas	2	H-3	250 ^{d, e}	(250) ^{d, e}	N/A	250 ^d	N/A	(250) ^d	50 ^d	N/A	(50) ^d
	1	N/A	4,000 ^{e, f}	(4,000) ^{e, f}	N/A	4,000 ^f	N/A	(4,000) ^f	1,000 ^f	N/A	(1,000) ^f
Oxidizing gas	Gaseous liquefied	H-3	N/A	N/A	1,500 ^{d, e}	N/A	N/A	1,500 ^{d, e}	N/A	N/A	N/A
	Gaseous liquefied	H-3	N/A	15 ^{d, e}	N/A	N/A	N/A	15 ^{d, e}	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^{a, j, m, n, p}

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE ^b			USE-CLOSED SYSTEMS ^b			USE-OPEN SYSTEMS ^b		
			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)
Pyrophoric material	N/A	H-2	4 ^{c, g}	(4) ^{c, g}	50 ^{c, g}	1 ^g	(1) ^g	10 ^{c, g}	0	0	0
Unstable (reactive)	4	H-1	1 ^{c, g}	(1) ^{c, g}	10 ^{d, g}	0.25 ^g	(0.25) ^g	2 ^{c, g}	0.25 ^g	(0.25) ^g	(0.25) ^g
	3	H-1 or H-2	5 ^{d, e}	(5) ^{d, e}	50 ^{d, e}	1 ^d	(1)	10 ^{d, e}	1 ^d	(1) ^d	(1) ^d
	2	H-3	50 ^{d, e}	(50) ^{d, e}	250 ^{d, e}	50 ^d	(50) ^d	250 ^{d, e}	10 ^d	(10) ^d	(10) ^d
	1	N/A	NL	NL	N/L	NL	N/L	NL	NL	NL	NL
Water reactive	3	H-2	5 ^{d, e}	(5) ^{d, e}	N/A	5 ^d	(5) ^d	N/A	1 ^d	(1) ^d	(1) ^d
	2	H-3	50 ^{d, e}	(50) ^{d, e}	N/A	50 ^d	(50) ^d	N/A	10 ^d	(10) ^d	(10) ^d
	1	N/A	NL	NL	N/A	NL	NL	N/A	NL	NL	NL

For SI: 1 cubic foot = 0.023 m³, 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 cumulatively.

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 cumulatively.

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 *Florida Fire Prevention 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 the *Florida Fire Prevention 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 *Florida Building Code, Fuel Gas*.
4. Liquid fuels in piping systems and fixed appliances regulated by the *Florida Building Code, Mechanical*.

[F] TABLE 307.1(2)
 MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIAL POSING A HEALTH HAZARD^{a, b, c, j}

MATERIAL	STORAGE ^d			USE-CLOSED SYSTEMS ^d			USE-OPEN SYSTEMS ^d	
	Solid pounds ^{e, f}	Liquid gallons (pounds) ^{e, f}	Gas (cubic feet at NTP) ^e	Solid pounds ^e	Liquid gallons (pounds) ^e	Gas (cubic feet at NTP) ^e	Solid pounds ^e	Liquid gallons (pounds) ^e
Corrosive	5,000	500	810 ^{f, g}	5,000	500	810 ^{f, g}	1,000	100
Highly toxic	10	(10) ⁱ	20 ^h	10	(10) ⁱ	20 ^h	3	(3) ⁱ
Toxic	500	(500) ⁱ	810 ^f	500	(500) ⁱ	810 ^f	125	(125) ⁱ

For SI: 1 cubic foot = 0.028 m³, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

a. For use of control areas, see Section 414.2.

b. 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.

c. 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).

d. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

e. 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.

f. Quantities shall be increased 100 percent when stored in approved storage cabinets, gas cabinets or exhausted enclosures as specified in the *Florida Fire Prevention Code*. Where Note e also applies, the increase for both notes shall be applied accumulatively.

g. 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.

h. Allowed only when stored in approved exhausted gas cabinets or exhausted enclosures as specified in the *Florida Fire Prevention Code*.

i. Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.

j. For gallons of liquids, divide the amount in pounds by 10 in accordance with the *Florida Fire Prevention Code*.

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 combustion that is greater than 13,000 Btu/lb (30 kJ/g).

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 or plastic bottles shall be limited to a maximum size of 4 fluid ounces (118 ml).

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).

BALED COTTON, DENSELY PACKED. Cotton made into banded bales with a packing density of at least 22 pounds per cubic foot (360 kg/m³), 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).

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.

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 evaporated point of a distillation performed in accordance with ASTM D 86 shall be used as the boiling point of the liquid.

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.

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 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, cer-

tain synthetic fibers or other like materials. This definition does not include densely packed baled cotton.

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.

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.

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 *Florida Fire Prevention Code*.

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.

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).

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 *Florida Fire Prevention Code*.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

HANDLING. The deliberate transport by any means to a point of storage or use.

HAZARDOUS MATERIALS. Those chemicals or substances that are physical hazards or health hazards as defined and classified in this section and the *Florida Fire Prevention Code*, || whether the materials are in usable or waste condition.

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.

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 (LD₅₀) 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 (LD₅₀) 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 (LC₅₀) 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.

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.

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.

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.

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.

OXIDIZER. A material that readily yields oxygen or other oxidizing gas, or that readily reacts to promote or initiate combustion 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.

OXIDIZING GAS. A gas that can support and accelerate combustion of other materials.

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.

PYROPHORIC. A chemical with an autoignition temperature in air, at or below a temperature of 130°F (54.4°C).

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.

TOXIC. A chemical falling within any of the following categories:

1. A chemical that has a median lethal dose (LD₅₀) 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 (LD₅₀) 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 (LC₅₀) 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.

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 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.

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.

[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

[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
- 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

[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

[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

[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.

[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.

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 or I-3.

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 *Florida Building Code, Residential* 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.

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 *Florida Building Code, Residential*.

308.3.1 Child care facility. A child care facility that provides care on a 24-hour basis to more than five children 2¹/₂ years of age or less shall be classified as Group I-2.

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).

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.

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.

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 comprised 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.

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.

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.

308.5 Group I-4, day care facilities. Reserved.

308.5.1 Adult care facility. Reserved.

308.5.2 Child care facility. Reserved.

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
- Restaurants and drinking establishments with an occupant load of less than 50 persons
- Sales rooms

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).

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 *Florida Building Code, Residential* 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 care 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 *Florida Building Code, Residential*.

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 *Florida Building Code, Residential*.

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.

BOARDING HOUSE. A building arranged or used for lodging for compensation, with or without meals, and not occupied as a single-family unit.

CONGREGATE LIVING FACILITIES. A building or part thereof that contains sleeping units where residents share bathroom and/or kitchen facilities.

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.

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.

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 facilities, social rehabilitation facilities, alcohol and drug abuse centers and convalescent facilities.

TRANSIENT. Occupancy of a dwelling unit or sleeping unit for not more than 30 days.

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.

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

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

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

**SECTION 313
DAY-CARE OCCUPANCY GROUP D**

313.1 Scope. Group D occupancy is the use of a building or structure, or any portion thereof, in which three or more clients receive care, maintenance and supervision, by other than their relative(s) or legal guardian(s), for less than 24 hours per day. Occupancies that include part-day preschools, kindergartens and other schools whose purpose is primarily educational even though the children are of preschool age shall comply with the provisions for Group E occupancies.

313.2 Subclassifications. Day care occupancies in which more than 12 clients receive care, maintenance and supervision, by other than their relative(s) or legal guardian(s), for less than 24 hours per day shall be classified as day care occupancies. Day care occupancies of 12 or fewer clients shall be classified as day care homes and shall be divided into classifications as set forth in this section.

313.2.1 Family day care home. A family day care home is a day care home in which more than three but fewer than seven clients receive care, maintenance and supervision by other than their relative(s) or legal guardian(s) for less than 24 hours per day with no more than two clients incapable of self-preservation.

313.2.2 Group day care home. A group day care home is a day-care home in which at least seven but not more than 12 clients receive care, maintenance, and supervision by other than their relative(s) or legal guardian(s) for less than 24 hours per day with no more than three clients incapable of self-preservation.

313.2.3 Adult day care. Adult day care shall include any building or portion thereof used for less than 24 hours per day to house more than three adults requiring care, maintenance and supervision by other than their relative(s). Clients shall be ambulatory or semiambulatory and shall not be bedridden. They shall not exhibit behavior that is harmful to themselves or others.

313.2.4 Group D occupancies. Group D occupancies shall include, among others, the following:

- Child day care occupancies
- Adult day care occupancies, except where part of a health care occupancy
- Nursery schools
- Day care homes
- Kindergarten classes that are incidental to a child day care occupancy

In cases where care is incidental to some other occupancy, the section of this code governing such other occupancy shall apply.

CHAPTER 4

SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

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.

401.2 Additional design criteria.

401.2.1 Scope. In addition to the provisions of this chapter, the following special occupancies, standards, requirements and codes shall conform to the following sections:

- Section 419: Hospitals
- Section 420: Nursing homes
- Section 421: Ambulatory surgical centers
- Section 422: Birthing centers
- Section 423: State requirements for educational facilities
- Section 424: Swimming pools and bathing places
- Section 425: Public lodging establishments
- Section 426: Public food service establishments
- Section 427: Mental health programs
- Section 428: Manufactured buildings
- Section 429: Boot camps for children
- Section 430: Mausoleums and columbariums
- Section 431: Transient public lodging establishments
- Section 432: Use of asbestos in new public buildings or buildings newly constructed for lease to government entities—prohibition
- Section 433: Adult day care
- Section 434: Assisted living facilities
- Section 435: Control of radiation hazards
- Section 436: Day care occupancies
- Section 437: Hospice inpatient facilities and units and hospice residences.
- Chapter 30: Elevators and conveying systems
- Section 3109: Structures seaward of a coastal construction control line
- Section 3110: Flood-resistant construction

401.2.2 General. Where in any specific case, Sections 419 through 437 specify different materials, methods of construction, design criteria or other requirements than found in this code, the requirements of Sections 419 through 437 shall be applicable.

401.2.3 Referenced standards. Further information concerning the requirements for licensing, maintenance, equipment or other items not related to design and construction

may be obtained for all state codes, rules and standards from the State of Florida Bureau of Administrative Codes.

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 this section, covered mall buildings shall meet applicable provisions of this code.

Exceptions:

1. Foyers and lobbies of Groups B, R-1 and R-2 are not required to comply with this section.
2. Buildings need not comply with the provisions of this section when they totally comply with other applicable provisions of this code.

402.1.1 Occupancy. Covered mall buildings shall be classified as Group M occupancies and may contain accessory uses consisting of Group A, B, D, E or R occupancies. Individual accessory uses within a covered mall building shall not exceed the sprinklered area limitation and shall not be located at a height greater than that permitted for such occupancy group in the type of construction being used. The aggregate area of all accessory uses within a covered mall building shall not exceed 25 percent of the gross leasable area.

402.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

ANCHOR BUILDING. An exterior perimeter building of a group other than H having direct access to a covered mall building but having required means of egress independent of the mall.

COVERED MALL BUILDING. A single building enclosing a number of tenants and occupants such as retail stores, drinking and dining establishments, entertainment and amusement facilities, passenger transportation terminals, offices, and other similar uses wherein two or more tenants have a main entrance into one or more malls. For the purpose of this chapter, anchor buildings shall not be considered as a part of the covered mall building.

FOOD COURT. A public seating area located in the mall that serves adjacent food preparation tenant spaces.

GROSS LEASABLE AREA. The total floor area designed for tenant occupancy and exclusive use. The area of tenant occupancy is measured from the centerlines of joint partitions to the outside of the tenant walls. All tenant areas, including

areas used for storage, shall be included in calculating gross leasable area.

MALL. A roofed or covered common pedestrian area within a covered mall building that serves as access for two or more tenants and not to exceed three levels that are open to each other.

402.3 Lease plan. Each covered mall building owner shall provide both the building and fire departments with a lease plan showing the location of each occupancy and its exits after the certificate of occupancy has been issued. No modifications or changes in occupancy or use shall be made from that shown on the lease plan without prior approval of the building official.

402.4 Means of egress. Each tenant space and the covered mall building shall be provided with means of egress as required by this section and this code. Where there is a conflict between the requirements of this code and the requirements of this section, the requirements of this section shall apply.

402.4.1 Determination of occupant load. The occupant load permitted in any individual tenant space in a covered mall building shall be determined as required by this code. Means of egress requirements for individual tenant spaces shall be based on the occupant load thus determined.

402.4.1.1 Occupant formula. In determining required means of egress of the mall, the number of occupants for whom means of egress are to be provided shall be based on gross leasable area of the covered mall building (excluding anchor buildings) and the occupant load factor as determined by the following equation.

$$OLF = (0.00007)(GLA) + 25 \quad \text{(Equation 4-1)}$$

where:

OLF = The occupant load factor (square feet per person).

GLA = The gross leasable area (square feet).

402.4.1.2 OLF range. The occupant load factor (*OLF*) is not required to be less than 30 and shall not exceed 50.

402.4.1.3 Anchor buildings. The occupant load of anchor buildings opening into the mall shall not be included in computing the total number of occupants for the mall.

402.4.1.4 Food courts. The occupant load of a food court shall be determined in accordance with Section 1004. For the purposes of determining the means of egress requirements for the mall, the food court occupant load shall be added to the occupant load of the covered mall building as calculated above.

402.4.2 Number of means of egress. Wherever the distance of travel to the mall from any location within a tenant space used by persons other than employees exceeds 75 feet (22 860 mm) or the tenant space has an occupant load of 50 or more, not less than two means of egress shall be provided.

402.4.3 Arrangements of means of egress. Assembly occupancies with an occupant load of 500 or more shall be so located in the covered mall building that their entrance will be immediately adjacent to a principal entrance to the

mall and shall have not less than one-half of their required means of egress opening directly to the exterior of the covered mall building.

402.4.3.1 Anchor building means of egress. Required means of egress for anchor buildings shall be provided independently from the mall means of egress system. The occupant load of anchor buildings opening into the mall shall not be included in determining means of egress requirements for the mall. The path of egress travel of malls shall not exit through anchor buildings. Malls terminating at an anchor building where no other means of egress has been provided shall be considered as a dead-end mall.

402.4.4 Distance to exits. Within each individual tenant space in a covered mall building, the maximum distance of travel from any point to an exit or entrance to the mall shall not exceed 200 feet (60 960 mm).

The maximum distance of travel from any point within a mall to an exit shall not exceed 200 feet (60 960 mm).

402.4.5 Access to exits. Where more than one exit is required, they shall be so arranged that it is possible to travel in either direction from any point in a mall to separate exits. The minimum width of an exit passageway or corridor from a mall shall be 66 inches (1676 mm).

Exception: Dead ends not exceeding a length equal to twice the width of the mall measured at the narrowest location within the dead-end portion of the mall.

402.4.5.1 Exit passageways. Where exit passageways provide a secondary means of egress from a tenant space, doorways to the exit passageway shall be protected by 1-hour fire door assemblies that are self- or automatic closing by smoke detection in accordance with Section 715.4.7.3.

402.4.6 Service areas fronting on exit passageways. Mechanical rooms, electrical rooms, building service areas and service elevators are permitted to open directly into exit passageways, provided the exit passageway is separated from such rooms with not less than 1-hour fire-resistance-rated fire barriers and 1-hour opening protectives. Such rooms or areas shall be protected by an approved supervised automatic sprinkler system in accordance with Section 903; however, the exception in NFPA 13, *Standard for the Installation of Sprinklers*, that permit the omission of sprinklers from such rooms shall not be permitted.

402.5 Mall width. For the purpose of providing required egress, malls are permitted to be considered as corridors but need not comply with the requirements of Section 1005.1 of this code where the width of the mall is as specified in this section.

402.5.1 Minimum width. The minimum width of the mall shall be 20 feet (6096 mm). The mall width shall be sufficient to accommodate the occupant load served. There shall be a minimum of 10 feet (3048 mm) clear exit width to a height of 8 feet (2438 mm) between any projection of a tenant space bordering the mall and the nearest kiosk, vending machine, bench, display opening, food court or other obstruction to means of egress travel.

402.6 Types of construction. The area of any covered mall building, including anchor buildings, of Type I, II, III and IV construction, shall not be limited provided the covered mall building and attached anchor buildings and parking garages are surrounded on all sides by a permanent open space of not less than 60 feet (18 288 mm) and the anchor buildings do not exceed three stories in height. The allowable height and area of anchor buildings greater than three stores in height shall comply with Section 503, as modified by Sections 504 and 506. The construction type of open parking garages and enclosed parking garages shall comply with Sections 406.3 and 406.4, respectively.

402.7 Fire-resistance-rated separation. Fire-resistance-rated separation is not required between tenant spaces and the mall. Fire-resistance-rated separation is not required between a food court and adjacent tenant spaces or the mall.

402.7.1 Attached garage. An attached garage for the storage of passenger vehicles having a capacity of not more than nine persons and open parking garages shall be considered as a separate building where it is separated from the covered mall building by a fire barrier having a fire-resistance rating of at least 2 hours.

Exception: Where an open parking garage or enclosed parking garage is separated from the covered mall building or anchor building a distance greater than 10 feet (3048 mm), the provisions of Table 602 shall apply. Pedestrian walkways and tunnels which attach the open parking garage or enclosed parking garage to the covered mall building or anchor building shall be constructed in accordance with Section 3104.

402.7.2 Tenant separations. Each tenant space shall be separated from other tenant spaces by a fire partition complying with Section 708. A tenant separation wall is not required between any tenant space and the mall.

402.7.3 Anchor building separation. An anchor building shall be separated from the covered mall building by fire walls complying with Section 705.

Exception: Anchor buildings of not more than three stories above grade plane that have an occupancy classification the same as that permitted for tenants of the covered mall building shall be separated by 2-hour fire-resistive fire barriers complying with Section 706.

402.7.3.1 Openings between anchor building and mall. Except for the separation between Group R-1 sleeping units and the mall, openings between anchor buildings of Type IA, IB, IIA and IIB construction and the mall need not be protected.

[F] 402.8 Automatic sprinkler system. The covered mall building and buildings connected shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, which shall comply with the following:

1. The automatic sprinkler system shall be complete and operative throughout occupied space in the covered mall building prior to occupancy of any of the tenant spaces. Unoccupied tenant spaces shall be similarly protected unless provided with approved alternate protection.

2. Sprinkler protection for the mall shall be independent from that provided for tenant spaces or anchors. Where tenant spaces are supplied by the same system, they shall be independently controlled.

Exception: An automatic sprinkler system shall not be required in spaces or areas of open parking garages constructed in accordance with Section 406.2.

[F] 402.8.1 Standpipe system. The covered mall building shall be equipped throughout with a standpipe system as required by Section 905.3.3.

402.9 Smoke control. A smoke control system shall be provided for atriums per Section 909.

402.10 Kiosks. Kiosks and similar structures (temporary or permanent) shall meet the following requirements:

1. Combustible kiosks or other structures shall not be located within the mall unless constructed of any of the following materials:
 - 1.1. Fire-retardant-treated wood complying with Section 2303.2.
 - 1.2. Foam plastics having a maximum heat release rate not greater than 100kW (105 Btu/h) when tested in accordance with the exhibit booth protocol in UL 1975.
 - 1.3. Aluminum composite material (ACM) having a flame spread index of not more than 25 and a smoke-developed index of not more than 450 when tested as an assembly in the maximum thickness intended for use in accordance with ASTM E 84.
2. Kiosks or similar structures located within the mall shall be provided with approved fire suppression and detection devices.
3. The minimum horizontal separation between kiosks or groupings thereof and other structures within the mall shall be 20 feet (6096 mm).
4. Each kiosk or similar structure or groupings thereof shall have a maximum area of 300 square feet (28 m²).

402.11 Children's playground structures. Structures intended as children's playgrounds that exceed 10 feet (3048 mm) in height and 150 square feet (14 m²) in area shall comply with the following.

402.11.1 Materials. Children's playground structures shall be constructed of noncombustible materials or of combustible materials that comply with the following:

1. Fire-retardant-treated wood.
2. Light-transmitting plastics complying with Section 2606.
3. Foam plastics (including the pipe foam used in soft-contained play equipment structures) having a maximum heat-release rate not greater than 100 kW when tested in accordance with UL 1975.
4. Aluminum composite material (ACM) meeting the requirements of Class A interior finish in accordance

with Chapter 8 when tested as an assembly in the maximum thickness intended for use.

5. Textiles and films complying with the flame propagation performance criteria contained in NFPA 701.
6. Plastic materials used to construct rigid components of soft-contained play equipment structures (such as tubes, windows, panels, junction boxes, pipes, slides and decks) meeting the UL 94 V-2 classification when tested in accordance with UL 94.
7. Ball pool balls, used in soft-contained play equipment structures, having a maximum heat release rate not greater than 100 kW when tested in accordance with UL 1975. The minimum specimen test size shall be 36 inches by 36 inches (914 mm by 914 mm) by an average of 21 inches (533 mm) deep, and the balls shall be held in a box constructed of galvanized steel poultry netting wire mesh.
8. Foam plastics shall be covered by a fabric, coating or film meeting the flame propagation performance criteria of NFPA 701.
9. The floor covering placed under the children's playground structure shall exhibit a Class I interior floor finish classification, as described in Section 804, when tested in accordance with NFPA 253.

402.11.2 Fire protection. Children's playground structures located within the mall shall be provided with the same level of approved fire suppression and detection devices required for kiosks and similar structures.

402.11.3 Separation. Children's playground structures shall have a minimum horizontal separation from other structures within the mall of 20 feet (6090 mm).

402.11.4 Area limits. Children's playground structures shall not exceed 300 square feet (28 m²) in area, unless a special investigation has demonstrated adequate fire safety.

402.12 Security grilles and doors. Horizontal sliding or vertical security grilles or doors that are a part of a required means of egress shall conform to the following:

1. They shall remain in the full open position during the period of occupancy by the general public.
2. Doors or grilles shall not be brought to the closed position when there are 10 or more persons occupying spaces served by a single exit or 50 or more persons occupying spaces served by more than one exit.
3. The doors or grilles shall be openable from within without the use of any special knowledge or effort where the space is occupied.
4. Where two or more exits are required, not more than one-half of the exits shall be permitted to include either a horizontal sliding or vertical rolling grille or door.

[F] 402.13 Standby power. Covered mall buildings exceeding 50,000 square feet (4645 m²) shall be provided with standby

power systems that are capable of operating the emergency voice/alarm communication system.

[F] 402.14 Emergency voice/alarm communication system. Covered mall buildings exceeding 50,000 square feet (4645 m²) in total floor area shall be provided with an emergency voice/alarm communication system. Emergency voice/alarm communication systems serving a mall, required or otherwise, shall be accessible to the fire department. The system shall be provided in accordance with Section 907.2.12.2.

402.15 Plastic signs. Plastic signs affixed to the storefront of any tenant space facing the mall shall be limited as specified in Sections 402.15.1 through 402.15.5.2.

402.15.1 Area. Plastic signs shall not exceed 20 percent of the wall area facing the mall.

402.15.2 Height and width. Plastic signs shall not exceed a height of 36 inches (914 mm), except if the sign is vertical, the height shall not exceed 96 inches (2438 mm) and the width shall not exceed 36 inches (914 mm).

402.15.3 Location. Plastic signs shall be located a minimum distance of 18 inches (457 mm) from adjacent tenants.

402.15.4 Plastics other than foam plastics. Plastics other than foam plastics used in signs shall be light-transmitting plastics complying with Section 2606.4 or shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929, and a flame spread index not greater than 75 and smoke-developed index not greater than 450 when tested in the manner intended for use in accordance with ASTM E 84 or meet the acceptance criteria of Section 803.2.1 when tested in accordance with NFPA 286.

402.15.4.1 Encasement. Edges and backs of plastic signs in the mall shall be fully encased in metal.

402.15.5 Foam plastics. Foam plastics used in signs shall have flame-retardant characteristics such that the sign has a maximum heat-release rate of 150 kilowatts when tested in accordance with UL 1975 and the foam plastics shall have the physical characteristics specified in this section. Foam plastics used in signs installed in accordance with Section 402.14 shall not be required to comply with the flame spread and smoke-developed indexes specified in Section 2603.3.

402.15.5.1 Density. The minimum density of foam plastics used in signs shall not be less than 20 pounds per cubic foot (pcf) (320 kg/m³).

402.15.5.2 Thickness. The thickness of foam plastic signs shall not be greater than 1/2 inch (12.7 mm).

[F] 402.16 Fire department access to equipment. Rooms or areas containing controls for air-conditioning systems, automatic fire-extinguishing systems or other detection, suppression or control elements shall be identified for use by the fire department.

SECTION 403 HIGH-RISE BUILDINGS

403.1 Applicability. The provisions of this section shall apply to buildings with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Exception: The provisions of this section shall not apply to the following buildings and structures:

1. Airport traffic control towers in accordance with Section 412.
2. Open parking garages in accordance with Section 406.3.
3. Buildings with an occupancy in Group A-5 in accordance with Section 303.1.
4. Low-hazard special industrial occupancies in accordance with Section 503.1.1.
5. Buildings with an occupancy in Group H-1, H-2 or H-3 in accordance with Section 415.

403.1.1 Accessibility. For accessibility provisions related to Group B and R occupancies, refer to Sections 11-5, 11-7, 11-9, and 11-11.

[F] 403.2 Automatic sprinkler system. Buildings and structures shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 903.3.5.2.

Exception: An automatic sprinkler system shall not be required in spaces or areas of:

1. Open parking garages in accordance with Section 406.3.
2. Telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by fire barriers consisting of not less than 1-hour fire-resistance-rated walls and 2-hour fire-resistance-rated floor/ceiling assemblies.

403.3 Reduction in fire-resistance rating. The fire-resistance-rating reductions listed in Sections 403.3.1 and 403.3.2 shall be allowed in buildings that have sprinkler control valves equipped with supervisory initiating devices and water-flow initiating devices for each floor.

403.3.1 Type of construction. In Type I-A construction the fire-resistance ratings of partitions, columns, trusses, girders, beams and floors may be reduced by 1 hour, but no component or assembly shall be less than 1 hour.

The height and area limitations of the reduced construction type shall be allowed to be the same as for the original construction type.

403.3.2 Shaft enclosures. For buildings not greater than 420 feet (128 m) in height, the required fire-resistance rat-

ing of the fire barriers enclosing vertical shafts, other than exit enclosures and elevator hoistway enclosures, shall be reduced to 1 hour where automatic sprinklers are installed within the shafts at the top and at alternate floor levels.

403.4 Emergency escape and rescue. Emergency escape and rescue openings required by Section 1026 are not required.

[F] 403.5 Automatic fire detection. Smoke detection shall be provided in accordance with Section 907.2.12.1.

[F] 403.6 Emergency voice/alarm communication systems. An emergency voice/alarm communication system shall be provided in accordance with Section 907.2.12.2.

[F] 403.7 Fire department communications system. A two-way fire department communications system shall be provided for fire department use in accordance with Section 907.2.12.3.

[F] 403.8 Fire command. A fire command center complying with Section 911 shall be provided in a location approved by the fire department.

403.9 Elevators. Elevator operation and installation shall be in accordance with Chapter 30.

[F] 403.10 Standby power. A standby power system complying with Section 2702 shall be provided for standby power loads specified in Section 403.10.2.

403.10.1 Special requirements for standby power systems. If the standby system is a generator set inside a building, the system shall be located in a separate room enclosed with 2-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. System supervision with manual start and transfer features shall be provided at the fire command center.

[F] 403.10.2 Standby power loads. The following are classified as standby power loads:

1. Power and lighting for the fire command center required by Section 403.8;
2. Electrically powered fire pumps; and
3. Ventilation and automatic fire detection equipment for smokeproof enclosures.

Standby power shall be provided for elevators in accordance with Sections 1007.4 and 3003.

[F] 403.11 Emergency power systems. An emergency power system complying with Section 2702 shall be provided for emergency power loads specified in Section 403.11.1.

[F] 403.11.1 Emergency power loads. The following are classified as emergency power loads:

1. Exit signs and means of egress illumination required by Chapter 10;
2. Elevator car lighting;
3. Emergency voice/alarm communications systems;
4. Automatic fire detection systems; and
5. Fire alarm systems.

403.12 Stairway door operation. Stairway doors other than the exit discharge doors shall be permitted to be locked from stairway side. Stairway doors that are locked from the stairway side shall be capable of being unlocked simultaneously without unlatching upon a signal from the fire command center.

403.12.1 Stairway communications system. A telephone or other two-way communications system connected to an approved constantly attended station shall be provided at not less than every fifth floor in each required stairway where the doors to the stairway are locked.

403.13 Smokeproof exit enclosures. Every required stairway serving floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access shall comply with Sections 909.20 and 1020.1.7.

403.14 Seismic considerations. Reserved.

403.15 Smoke control shall be provided in accordance with Section 909.

Exception: I-2 occupancies that comply with Section 407, 419.3.12 and 420.3.16 shall not require smoke control systems in accordance with Section 909.

SECTION 404 ATRIUMS

404.1 General. In other than Group H occupancies, and where permitted by Exception 5 in Section 707.2, the provisions of this section shall apply to buildings or structures containing vertical openings defined herein as “Atriums.”

404.1.1 Definition. The following word and term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

ATRIUM. An opening connecting two or more stories other than enclosed stairways, elevators, hoistways, escalators, plumbing, electrical, air-conditioning or other equipment, which is closed at the top and not defined as a mall. Stories, as used in this definition, do not include balconies within assembly groups or mezzanines that comply with Section 505.

404.2 Use. The atrium floor area is permitted to be used for low and ordinary fire hazard uses where the individual space is protected with an automatic sprinkler system in accordance with Section 903.3.1.1.

[F] 404.3 Automatic sprinkler protection. An approved automatic sprinkler system shall be installed throughout the entire building.

404.4 Smoke control. A smoke control system shall be installed in accordance with Section 909.

Exception: Smoke control is not required for atriums that connect only two stories.

404.5 Enclosure of atriums. Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 706 or a horizontal assembly constructed in accordance with Section 711, or both.

Exceptions:

1. A glass wall forming a smoke partition where automatic sprinklers are spaced 6 feet (1829 mm) or less along both sides of the separation wall, or on the room side only if there is not a walkway on the atrium side, and between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction. The glass shall be installed in a gasketed frame so that the framing system deflects without breaking (loading) the glass before the sprinkler system operates.
2. A glass-block wall assembly in accordance with Section 2110 and having a $3/4$ -hour fire protection rating.
3. The adjacent spaces of any three floors of the atrium shall not be required to be separated from the atrium where such spaces are included in the design of the smoke control system.

[F] 404.6 Standby power. Equipment required to provide smoke control shall be connected to a standby power system in accordance with Section 909.11.

404.7 Interior finish. The interior finish of walls and ceilings of the atrium shall not be less than Class B with no reduction in class for sprinkler protection.

404.8 Travel distance. In other than the lowest level of the atrium, where the required means of egress is through the atrium space, the portion of exit access travel distance within the atrium space shall not exceed 200 feet (60 960 mm).

SECTION 405 UNDERGROUND BUILDINGS

405.1 General. The provisions of this section apply to building spaces having a floor level used for human occupancy more than 30 feet (9144 mm) below the lowest level of exit discharge.

Exceptions:

1. One- and two-family dwellings, sprinklered in accordance with Section 903.3.1.3.
2. Parking garages with automatic sprinkler systems in compliance with Section 405.3.
3. Fixed guideway transit systems.
4. Grandstands, bleachers, stadiums, arenas and similar facilities.
5. Where the lowest story is the only story that would qualify the building as an underground building and has an area not exceeding 1,500 square feet (139 m²) and has an occupant load less than 10.

405.2 Construction requirements. The underground portion of the building shall be of Type I construction.

405.3 Limited access protection. Underground and limited access structures, and all areas and floor levels traversed in traveling to the exit discharge, shall be protected by an

approved, supervised automatic sprinkler system in accordance with Section 903, unless such structures meet one of the following criteria:

1. They have an occupant load of 50 or fewer persons in new underground or limited access portions of the structure.
2. They have an occupant load of 100 or fewer persons in existing underground or limited access portions of the structure.
3. The structure is a single-story underground or limited access structure that is permitted to have a single exit per this code, with a common path of travel not greater than 15 meters (50 ft).

405.4 Compartmentation. Compartmentation shall be in accordance with Sections 405.4.1 through 405.4.3.

405.4.1 Number of compartments. A building having a floor level more than 60 feet (18 288 mm) below the lowest level of exit discharge shall be divided into a minimum of two compartments of approximately equal size. Such compartmentation shall extend through the highest level of exit discharge serving the underground portions of the building and all levels below.

Exception: The lowest story need not be compartmented where the area does not exceed 1,500 square feet (139 m²) and has an occupant load of less than 10.

405.4.2 Smoke barrier penetration. The compartments shall be separated from each other by a smoke barrier in accordance with Section 709. Penetrations between the two compartments shall be limited to plumbing and electrical piping and conduit that are firestopped in accordance with Section 712. Doorways shall be protected by fire door assemblies that are automatic closing by smoke detection in accordance with Section 715.4.7.3 and are installed in accordance with NFPA 105 and Section 715.4.3. Where provided, each compartment shall have an air supply and an exhaust system independent of the other compartments.

405.4.3 Elevators. Where elevators are provided, each compartment shall have direct access to an elevator. Where an elevator serves more than one compartment, an elevator lobby shall be provided and shall be separated from each compartment by a smoke barrier in accordance with Section 709. Doors shall be gasketed, have a drop sill and be automatic closing by smoke detection in accordance with Section 715.4.7.3.

[F] **405.5 Smoke control system.** A smoke control system shall be provided in accordance with Sections 405.5.1 and 405.5.2.

[F] **405.5.1 Control system.** A smoke control system is required to control the migration of products of combustion in accordance with Section 909 and the provisions of this section. Smoke control shall restrict movement of smoke to the general area of fire origin and maintain means of egress in a usable condition.

[F] **405.5.2 Compartment smoke control system.** Where compartmentation is required, each compartment shall have an independent smoke control system. The system shall be

automatically activated and capable of manual operation in accordance with Section 907.2.18.

[F] **405.6 Fire alarm systems.** A fire alarm system shall be provided where required by Section 907.2.19.

[F] **405.7 Public address.** A public address system shall be provided where required by Section 907.2.19.1.

405.8 Means of egress. Means of egress shall be in accordance with Sections 405.8.1 and 405.8.2.

405.8.1 Number of exits. Each floor level shall be provided with a minimum of two exits. Where compartmentation is required by Section 405.4, each compartment shall have a minimum of one exit and shall also have an exit access doorway into the adjoining compartment.

405.8.2 Smokeproof enclosure. Every required stairway serving floor levels more than 30 feet (9144 mm) below its level of exit discharge shall comply with the requirements for a smokeproof enclosure as provided in Section 1020.1.7.

[F] **405.9 Standby power.** A standby power system complying with Section 2702 shall be provided standby power loads specified in Section 405.9.1.

405.9.1 Standby power loads. The following loads are classified as standby power loads.

1. Smoke control system.
2. Ventilation and automatic fire detection equipment for smokeproof enclosures.
3. Fire pumps.

Standby power shall be provided for elevators in accordance with Section 3003.

405.9.2 Pick-up time. The standby power system shall pick up its connected loads within 60 seconds of failure of the normal power supply.

[F] **405.10 Emergency power.** An emergency power system complying with Section 2702 shall be provided for emergency power loads specified in Section 405.10.1.

[F] **405.10.1 Emergency power loads.** The following loads are classified as emergency power loads:

1. Emergency voice/alarm communications systems.
2. Fire alarm systems.
3. Automatic fire detection systems.
4. Elevator car lighting.
5. Means of egress and exit sign illumination as required by Chapter 10.

[F] **405.11 Standpipe system.** The underground building shall be equipped throughout with a standpipe system in accordance with Section 905.

SECTION 406 MOTOR-VEHICLE-RELATED OCCUPANCIES

406.1 Private garages and carports.

406.1.1 Classification. Buildings or parts of buildings classified as Group U occupancies because of the use or charac-

ter of the occupancy shall not exceed 1,000 square feet (93 m²) in area or one story in height except as provided in Section 406.1.2. Any building or portion thereof that exceeds the limitations specified in this section shall be classified in the occupancy group other than Group U that it most nearly resembles.

406.1.2 Area increase. Group U occupancies used for the storage of private or pleasure-type motor vehicles where no repair work is completed or fuel is dispensed are permitted to be 3,000 square feet (279 m²) when the following provisions are met:

1. For a mixed occupancy building, the exterior wall and opening protection for the Group U portion of the building shall be as required for the major occupancy of the building. For such a mixed occupancy building, the allowable floor area of the building shall be as permitted for the major occupancy contained therein.
2. For a building containing only a Group U occupancy, the exterior wall shall not be required to have a fire-resistance rating and the area of openings shall not be limited when the fire separation distance is 5 feet (1524 mm) or more.

More than one 3,000-square-foot (279 m²) Group U occupancy shall be permitted to be in the same building, provided each 3,000-square-foot (279 m²) area is separated by fire walls complying with Section 705.

406.1.3 Garages and carports. Carports shall be open on at least two sides. Carport floor surfaces shall be of approved noncombustible material. Carports not open on at least two sides shall be considered a garage and shall comply with the provisions of this section for garages.

Exception: Asphalt surfaces shall be permitted at ground level in carports.

The area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.

406.1.4 Separation. Separations shall comply with the following:

1. The private garage shall be separated from the dwelling unit and its attic area by means of a minimum 1/2-inch (12.7 mm) gypsum board applied to the garage side. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than a 5/8-inch Type X gypsum board or equivalent. Door openings between a private garage and the dwelling unit shall be equipped with either solid wood doors or solid or honeycomb core steel doors not less than 1 3/8 inches (34.9 mm) thick, or doors in compliance with Section 715.4.3. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Doors shall be self-closing and self-latching.
2. Ducts in a private garage and ducts penetrating the walls or ceilings separating the dwelling unit from the garage shall be constructed of a minimum 0.019-inch

(0.48 mm) sheet steel and shall have no openings into the garage.

3. A separation is not required between a Group R-3 and U carport, provided the carport is entirely open on two or more sides and there are not enclosed areas above.

406.2 Parking garages.

406.2.1 Classification. Parking garages shall be classified as either open, as defined in Section 406.3, or enclosed and shall meet the appropriate criteria in Section 406.4. Also see Section 509 for special provisions for parking garages.

406.2.2 Clear height. The clear height of each floor level in vehicle and pedestrian traffic areas shall not be less than 7 feet (2134 mm). Vehicle and pedestrian areas accommodating van-accessible parking shall be in accordance with Chapter 11.

406.2.3 Guards. Guards shall be provided in accordance with Section 1013 at exterior and interior vertical openings on floor and roof areas where vehicles are parked or moved and where the vertical distance to the ground or surface directly below exceeds 30 inches (762 mm).

406.2.4 Vehicle barriers. Parking areas shall be provided with exterior or interior walls or vehicle barriers, except at pedestrian or vehicular accesses, designed in accordance with Section 1607.7. Vehicle barriers not less than 2 feet (607 mm) high shall be placed at the end of drive lanes, and at the end of parking spaces where the difference in adjacent floor elevation is greater than 1 foot (305 mm).

Exception: Vehicle storage compartments in a mechanical access parking garage.

406.2.5 Ramps. Vehicle ramps shall not be considered as required exits unless pedestrian facilities are provided. Vehicle ramps that are utilized for vertical circulation as well as for parking shall not exceed a slope of 1:15 (6.67 percent).

406.2.6 Floor surface. Parking surfaces shall be of concrete or similar noncombustible and nonabsorbent materials.

Exception: Asphalt parking surfaces are permitted at ground level.

The area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.

406.2.7 Mixed separation. Parking garages shall be separated from other occupancies in accordance with Section 508.3.

406.2.8 Special hazards. Connection of a parking garage with any room in which there is a fuel-fired appliance shall be by means of a vestibule providing a two-doorway separation.

Exception: A single door shall be allowed provided the sources of ignition in the appliance are at least 18 inches (457 mm) above the floor.

406.2.9 Attached to rooms. Openings from a parking garage directly into a room used for sleeping purposes shall not be permitted.

406.3 Open parking garages.

406.3.1 Scope. Except where specific provisions are made in the following subsections, other requirements of this code shall apply.

406.3.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

MECHANICAL-ACCESS OPEN PARKING GARAGES. Open parking garages employing parking machines, lifts, elevators or other mechanical devices for vehicles moving from and to street level and in which public occupancy is prohibited above the street level.

OPEN PARKING GARAGE. A structure or portion of a structure with the openings as described in Section 406.3.3.1 on two or more sides that is used for the parking or storage of private motor vehicles as described in Section 406.3.4.

RAMP-ACCESS OPEN PARKING GARAGES. Open parking garages employing a series of continuously rising floors or a series of interconnecting ramps between floors permitting the movement of vehicles under their own power from and to the street level.

406.3.3 Construction. Open parking garages shall be of Type I, II or IV construction. Open parking garages shall meet the design requirements of Chapter 16. For vehicle barriers, see Section 406.2.4.

406.3.3.1 Openings. For natural ventilation purposes, the exterior side of the structure shall have uniformly distributed openings on two or more sides. The area of such openings in exterior walls on a tier must be at least 20 percent of the total perimeter wall area of each tier. The aggregate length of the openings considered to be providing natural ventilation shall constitute a minimum of 40 percent of the perimeter of the tier. Interior walls shall be at least 20 percent open with uniformly distributed openings.

Exception: Openings are not required to be distributed over 40 percent of the building perimeter where the required openings are uniformly distributed over two opposing sides of the building.

406.3.4 Uses. Mixed uses shall be allowed in the same building as an open parking garage subject to the provisions of Sections 508.3, 402.7.1, 406.3.13, 509.3, 509.4 and 509.7.

406.3.5 Area and height. Area and height of open parking garages shall be limited as set forth in Chapter 5 for Group S-2 occupancies and as further provided for in Section 508.3.

406.3.5.1 Single use. When the open parking garage is used exclusively for the parking or storage of private motor vehicles, with no other uses in the building, the area and height shall be permitted to comply with Table 406.3.5, along with increases allowed by Section 406.3.6.

Exception: The grade-level tier is permitted to contain an office, waiting and toilet rooms having a total combined area of not more than 1,000 square feet (93 m²). Such area need not be separated from the open parking garage.

In open parking garages having a spiral or sloping floor, the horizontal projection of the structure at any cross section shall not exceed the allowable area per parking tier. In the case of an open parking garage having a continuous spiral floor, each 9 feet 6 inches (2896 mm) of height, or portion thereof, shall be considered a tier.

The clear height of a parking tier shall not be less than 7 feet (2134 mm), except that a lower clear height is permitted in mechanical-access open parking garages where approved by the building official.

406.3.6 Area and height increases. The allowable area and height of open parking garages shall be increased in accordance with the provisions of this section. Garages with sides open on three-fourths of the building’s perimeter are permitted to be increased by 25 percent in area and one tier in height. Garages with sides open around the entire building’s perimeter are permitted to be increased by 50 percent in area and one tier in height. For a side to be considered open under the above provisions, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier.

**TABLE 406.3.5
OPEN PARKING GARAGES AREA AND HEIGHT**

TYPE OF CONSTRUCTION	AREA PER TIER (square feet)	Ramp access	HEIGHT (in tiers)	
			Mechanical access	
			Automatic sprinkler system	
			No	Yes
IA	Unlimited	Unlimited	Unlimited	Unlimited
IB	Unlimited	12 tiers	12 tiers	18 tiers
IIA	50,000	10 tiers	10 tiers	15 tiers
IIB	50,000	8 tiers	8 tiers	12 tiers
IV	50,000	4 tiers	4 tiers	4 tiers

For SI: 1 square foot = 0.0929 m².

Allowable tier areas in Table 406.3.5 shall be increased for open parking garages constructed to heights less than the table maximum. The gross tier area of the garage shall not exceed that permitted for the higher structure. At least three sides of each such larger tier shall have continuous horizontal openings not less than 30 inches (762 mm) in clear height extending for at least 80 percent of the length of the sides and no part of such larger tier shall be more than 200 feet (60 960 mm) horizontally from such an opening. In addition, each such opening shall face a street or yard accessible to a street with a width of at least 30 feet (9144 mm) for the full length of the opening, and standpipes shall be provided in each such tier.

Open parking garages of Type II construction, with all sides open, shall be unlimited in allowable area where the height does not exceed 75 feet (22 860 mm). For a side to be considered open, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier. All portions of tiers shall be within 200 feet (60 960 mm) horizontally from such openings or other natural ventilation openings as defined in Section 406.3.3.1. These openings shall be permitted to be provided in courts with a minimum width of 30 feet (9144 mm) for the full width of the openings.

406.3.7 Fire separation distance. Exterior walls and openings in exterior walls shall comply with Tables 601 and 602. The distance to an adjacent lot line shall be determined in accordance with Table 602 and Section 704.

406.3.8 Means of egress. Where persons other than parking attendants are permitted, open parking garages shall meet the means of egress requirements of Chapter 10. Where no persons other than parking attendants are permitted, there shall not be less than two 36-inch-wide (914 mm) exit stairways. Lifts shall be permitted to be installed for use of employees only, provided they are completely enclosed by noncombustible materials.

406.3.9 Standpipes. Standpipes shall be installed where required by the provisions of Chapter 9.

406.3.10 Sprinkler systems. Where required by other provisions of this code, automatic sprinkler systems and standpipes shall be installed in accordance with the provisions of Chapter 9.

406.3.11 Enclosure of vertical openings. Enclosure shall not be required for vertical openings except as specified in Section 406.3.8.

406.3.12 Ventilation. Ventilation, other than the percentage of openings specified in Section 406.3.3.1, shall not be required.

406.3.13 Prohibitions. The following uses and alterations are not permitted:

1. Vehicle repair work.
2. Parking of buses, trucks and similar vehicles.
3. Partial or complete closing of required openings in exterior walls by tarpaulins or any other means.
4. Dispensing of fuel.

406.4 Enclosed parking garages.

406.4.1 Heights and areas. Enclosed vehicle parking garages and portions thereof that do not meet the definition of open parking garages shall be limited to the allowable heights and areas specified in Table 503 as modified by Sections 504, 506 and 507. Roof parking is permitted.

406.4.2 Ventilation. A mechanical ventilation system shall be provided in accordance with the *Florida Building Code, Mechanical*.

406.5 Motor fuel-dispensing facilities.

406.5.1 Construction. Motor fuel-dispensing facilities shall be constructed in accordance with the *Florida Fire Prevention Code* and this section.

406.5.2 Canopies. Canopies under which fuels are dispensed shall have a clear, unobstructed height of not less than 13 feet 6 inches (4115 mm) to the lowest projecting element in the vehicle drive-through area. Canopies and their supports over pumps shall be of noncombustible materials, fire-retardant-treated wood complying with Chapter 23, wood of Type IV sizes or of construction providing 1-hour fire resistance. Combustible materials used in or on a canopy shall comply with one of the following:

1. Shielded from the pumps by a noncombustible element of the canopy, or wood of Type IV sizes;
2. Plastics covered by aluminum facing having a minimum thickness of 0.010 inch (0.30 mm) or corrosion-resistant steel having a minimum base metal thickness of 0.016 inch (0.41 mm). The plastic shall have a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in the form intended for use in accordance with ASTM E 84 and a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929; or
3. Panels constructed of light-transmitting plastic materials shall be permitted to be installed in canopies erected over motor vehicle fuel-dispensing station fuel dispensers, provided the panels are located at least 10 feet (3048 mm) from any building on the same lot and face yards or streets not less than 40 feet (12 192 mm) in width on the other sides. The aggregate areas of plastics shall not exceed 1,000 square feet (93 m²). The maximum area of any individual panel shall not exceed 100 square feet (9.3 m²).

406.5.2.1 Canopies used to support gaseous hydrogen systems. Canopies that are used to shelter dispensing operations where flammable compressed gases are located on the roof of the canopy shall be in accordance with the following:

1. The canopy shall meet or exceed Type I construction requirements.
2. Operations located under canopies shall be limited to refueling only.
3. The canopy shall be constructed in a manner that prevents the accumulation of hydrogen gas.

406.5.3 Pumps or other dispensing devices installed above grade shall be mounted on a concrete foundation and protected against vehicle damage by mounting on a concrete island or other approved collision protection. Subsurface pumps shall be installed in accordance with approved standards.

406.6 Repair garages.

406.6.1 General. Repair garages shall be constructed in accordance with the *Florida Fire Prevention Code* and this section. This occupancy shall not include motor fuel-dispensing facilities, as regulated in Section 406.5.

406.6.2 Mixed uses. Mixed uses shall be allowed in the same building as a repair garage subject to the provisions of Section 508.3.

406.6.3 Ventilation. Repair garages shall be mechanically ventilated in accordance with the *Florida Building Code, Mechanical*. The ventilation system shall be controlled at the entrance to the garage.

406.6.4 Floor surface. Repair garage floors shall be of concrete or similar noncombustible and nonabsorbent materials.

Exception: Slip-resistant, nonabsorbent, interior floor finishes having a critical radiant flux not more than 0.45 W/cm², as determined by NFPA 253, shall be permitted.

406.6.5 Heating equipment. Heating equipment shall be installed in accordance with the *Florida Building Code, Mechanical*.

[F] 406.6.6 Gas detection system. Repair garages used for repair of vehicles fueled by nonodorized gases, such as hydrogen and nonodorized LNG, shall be provided with an approved flammable gas-detection system.

[F] 406.6.6.1 System design. The flammable gas-detection system shall be calibrated to the types of fuels or gases used by vehicles to be repaired. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower explosive limit. Gas detection shall also be provided in lubrication or chassis repair pits of garages used for repairing nonodorized LNG-fueled vehicles.

[F] 406.6.6.2 Operation. Activation of the gas detection system shall result in all of the following:

1. Initiation of distinct audible and visual alarm signals in the repair garage.
2. Deactivation of all heating systems located in the repair garage.
3. Activation of the mechanical ventilation system, where the system is interlocked with gas detection.

[F] 406.6.6.3 Failure of the gas detection system. Failure of the gas detection system shall result in the deactivation of the heating system, activation of the mechanical ventilation system when the system is interlocked with the gas detection system and cause a trouble signal to sound in an approved location.

SECTION 407 GROUP I-2

407.1 General. Occupancies in Group I-2 shall comply with the provisions of this section and other applicable provisions of this code.

407.2 Corridors. Corridors in occupancies in Group I-2 shall be continuous to the exits and separated from other areas in accordance with Section 407.3 except spaces conforming to Sections 407.2.1 through 407.2.4.

407.2.1 Spaces of unlimited area. Waiting areas and similar spaces constructed as required for corridors shall be permitted to be open to a corridor, only where all of the following criteria are met:

1. The spaces are not occupied for patient sleeping units, treatment rooms, hazardous or incidental use areas as defined in Section 508.2.
2. The open space is protected by an automatic fire detection system installed in accordance with Section 907.
3. The corridors onto which the spaces open, in the same smoke compartment, are protected by an automatic fire detection system installed in accordance with Section 907, or the smoke compartment in which the spaces are located is equipped throughout with quick-response sprinklers in accordance with Section 903.3.2.
4. The space is arranged so as not to obstruct access to the required exits.

407.2.2 Nurses' stations. Spaces for doctors' and nurses' charting, communications and related clerical areas shall be permitted to be open to the corridor, when such spaces are constructed as required for corridors.

407.2.3 Mental health treatment areas. Areas wherein mental health patients who are not capable of self-preservation are housed, or group meeting or multipurpose therapeutic spaces other than incidental use areas as defined in Section 508.2, under continuous supervision by facility staff, shall be permitted to be open to the corridor, where the following criteria are met:

1. Each area does not exceed 1,500 square feet (140 m²).
2. The area is located to permit supervision by the facility staff.
3. The area is arranged so as not to obstruct any access to the required exits.
4. The area is equipped with an automatic fire detection system installed in accordance with Section 907.2.
5. Not more than one such space is permitted in any one smoke compartment.
6. The walls and ceilings of the space are constructed as required for corridors.

407.2.4 Gift shops. Gift shops less than 500 square feet (46.5 m²) in area shall be permitted to be open to the corridor provided the gift shop and storage areas are fully

sprinklered and storage areas are protected in accordance with Section 508.2.

407.3 Corridor walls. Corridor walls shall be constructed as smoke partitions in accordance with Section 710.

407.3.1 Corridor doors. Corridor doors, other than those in a wall required to be rated by Section 508.2 or for the enclosure of a vertical opening or an exit, shall not have a required fire protection rating and shall not be required to be equipped with self-closing or automatic-closing devices, but shall provide an effective barrier to limit the transfer of smoke and shall be equipped with positive latching. Roller latches are not permitted. Other doors shall conform to Section 715.4.

407.3.2 Locking devices. Locking devices that restrict access to the patient room from the corridor, and that are operable only by staff from the corridor side, shall not restrict the means of egress from the patient room except for patient rooms in mental health facilities.

407.4 Smoke barriers. Smoke barriers shall be provided to subdivide every story used by patients for sleeping or treatment and to divide other stories with an occupant load of 50 or more persons, into at least two smoke compartments. Such stories shall be divided into smoke compartments with an area of not more than 22,500 square feet (2092 m²) and the travel distance from any point in a smoke compartment to a smoke barrier door shall not exceed 200 feet (60 960 mm). The smoke barrier shall be in accordance with Section 709.

407.4.1 Refuge area. At least 30 net square feet (2.8 m²) per patient shall be provided within the aggregate area of corridors, patient rooms, treatment rooms, lounge or dining areas and other low-hazard areas on each side of each smoke barrier. On floors not housing patients confined to a bed or litter, at least 6 net square feet (0.56 m²) per occupant shall be provided on each side of each smoke barrier for the total number of occupants in adjoining smoke compartments.

407.4.2 Independent egress. A means of egress shall be provided from each smoke compartment created by smoke barriers without having to return through the smoke compartment from which means of egress originated.

[F] 407.5 Automatic sprinkler system. Smoke compartments containing patient sleeping units shall be equipped throughout with an automatic fire sprinkler system in accordance with Section 903.3.1.1. The smoke compartments shall be equipped with approved quick-response or residential sprinklers in accordance with Section 903.3.2.

[F] 407.6 Automatic fire detection. Corridors in nursing homes (both intermediate care and skilled nursing facilities), detoxification facilities and spaces permitted to be open to the corridors by Section 407.2 shall be equipped with an automatic fire detection system. Hospitals shall be equipped with smoke detection as required in Section 407.2.

Exceptions:

1. Corridor smoke detection is not required where patient sleeping units are provided with smoke detectors that comply with UL 268. Such detectors shall provide a visual display on the corridor side of each

patient sleeping unit and an audible and visual alarm at the nursing station attending each unit.

2. Corridor smoke detection is not required where patient sleeping unit doors are equipped with automatic door-closing devices with integral smoke detectors on the unit sides installed in accordance with their listing, provided that the integral detectors perform the required alerting function.

407.7 Secured yards. Grounds are permitted to be fenced and gates therein are permitted to be equipped with locks, provided that safe dispersal areas having 30 net square feet (2.8 m²) for bed and litter patients and 6 net square feet (0.56 m²) for ambulatory patients and other occupants are located between the building and the fence. Such provided safe dispersal areas shall not be located less than 50 feet (15 240 mm) from the building they serve.

**SECTION 408
GROUP I-3**

408.1 General. Occupancies in Group I-3 shall comply with the provisions of this section and other applicable provisions of this code (see Section 308.4).

408.2 Mixed occupancies. Portions of buildings with an occupancy in Group I-3 that are classified as a different occupancy shall meet the applicable requirements of this code for such occupancies. Where security operations necessitate the locking of required means of egress, provisions shall be made for the release of occupants at all times.

Means of egress from detention and correctional occupancies that traverse other use areas shall, as a minimum, conform to requirements for detention and correctional occupancies.

Exception: It is permissible to exit through a horizontal exit into other contiguous occupancies that do not conform to detention and correctional occupancy egress provisions but that do comply with requirements set forth in the appropriate occupancy, as long as the occupancy is not a high-hazard use.

408.3 Means of egress. Except as modified or as provided for in this section, the provisions of Chapter 10 shall apply.

408.3.1 Door width. Doors to resident sleeping units shall have a clear width of not less than 28 inches (711 mm).

408.3.2 Sliding doors. Where doors in a means of egress are of the horizontal-sliding type, the force to slide the door to its fully open position shall not exceed 50 pounds (220 N) with a perpendicular force against the door of 50 pounds (220 N).

408.3.3 Spiral stairs. Spiral stairs that conform to the requirements of Section 1009.8 are permitted for access to and between staff locations.

408.3.4 Exit discharge. Exits are permitted to discharge into a fenced or walled courtyard. Enclosed yards or courts shall be of a size to accommodate all occupants, a minimum of 50 feet (15 240 mm) from the building with a net area of 15 square feet (1.4 m²) per person.

408.3.5 Sallyports. A sallyport shall be permitted in a means of egress where there are provisions for continuous

and unobstructed passage through the sallyport during an emergency egress condition.

408.3.6 Exit enclosures. One of the required exit enclosures in each building shall be permitted to have glazing installed in doors and interior walls at each landing level providing access to the enclosure, provided that the following conditions are met:

1. The exit enclosure shall not serve more than four floor levels.
2. Exit doors shall not be less than $3/4$ -hour fire door assemblies complying with Section 715.4
3. The total area of glazing at each floor level shall not exceed 5,000 square inches (3 m^2) and individual panels of glazing shall not exceed 1,296 square inches (0.84 m^2).
4. The glazing shall be protected on both sides by an automatic fire sprinkler system. The sprinkler system shall be designed to wet completely the entire surface of any glazing affected by fire when actuated.
5. The glazing shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler system operates.
6. Obstructions, such as curtain rods, drapery traverse rods, curtains, drapes or similar materials shall not be installed between the automatic sprinklers and the glazing.

408.4 Locks. Egress doors are permitted to be locked in accordance with the applicable use condition. Doors from an area of refuge to the exterior are permitted to be locked with a key in lieu of locking methods described in Section 408.4.1. The keys to unlock the exterior doors shall be available at all times and the locks shall be operable from both sides of the door.

408.4.1 Remote release. Remote release of locks on doors in a means of egress shall be provided with reliable means of operation, remote from the resident living areas, to release locks on all required doors. In Occupancy Conditions 3 or 4, the arrangement, accessibility and security of the release mechanism(s) required for egress shall be such that with the minimum available staff at any time, the lock mechanisms are capable of being released within 2 minutes.

Exception: Provisions for remote locking and unlocking of occupied rooms in Occupancy Condition 4 are not required provided that not more than 10 locks are necessary to be unlocked in order to move occupants from one smoke compartment to a refuge area within 3 minutes. The opening of necessary locks shall be accomplished with not more than two separate keys.

408.4.2 Power-operated doors and locks. Power-operated sliding doors or power-operated locks for swinging doors shall be operable by a manual release mechanism at the door, and either emergency power or a remote mechanical operating release shall be provided.

Exception: Emergency power is not required in facilities with 10 locks or less complying with the exception to Section 408.4.1.

408.4.3 Redundant operation. Remote release, mechanically operated sliding doors or remote release, mechanically operated locks shall be provided with a mechanically operated release mechanism at each door, or shall be provided with a redundant remote release control.

408.4.4 Relock capability. Doors remotely unlocked under emergency conditions shall not automatically relock when closed unless specific action is taken at the remote location to enable doors to relock.

408.5 Vertical openings. Vertical openings shall be enclosed in accordance with Section 707.

Exception: A floor opening between floor levels of residential housing areas is permitted without enclosure protection between the levels, provided that both of the following conditions are met:

1. The entire normally occupied areas so interconnected are open and unobstructed so as to enable observation of the areas by supervisory personnel.
2. Means of egress capacity is sufficient to provide simultaneous egress for all occupants from all interconnected levels and areas.

The height difference between the highest and lowest finished floor levels shall not exceed 23 feet (7010 mm). Each story, considered separately, has at least one-half of its individual required means of egress capacity provided by exits leading directly out of that story without traversing another story within the interconnected area.

408.6 Smoke barrier. Occupancies in Group I-3 shall have smoke barriers complying with Section 709 to divide every story occupied by residents for sleeping, or any other story having an occupant load of 50 or more persons, into at least two smoke compartments.

Exception: Spaces having a direct exit to one of the following, provided that the locking arrangement of the doors involved complies with the requirements for doors at the smoke barrier for the use condition involved:

1. A public way.
2. A building separated from the resident housing area by a 2-hour fire-resistance-rated assembly or 50 feet (15 240 mm) of open space.
3. A secured yard or court having a holding space 50 feet (15 240 mm) from the housing area that provides 6 square feet (0.56 m^2) or more of refuge area per occupant, including residents, staff and visitors.

408.6.1 Smoke compartments. The maximum number of residents in any smoke compartment shall be 200. The travel distance to a door in a smoke barrier from any room door required as exit access shall not exceed 150 feet (45 720 mm). The travel distance to a door in a smoke barrier from any point in a room shall not exceed 200 feet (60 960 mm).

408.6.2 Refuge area. At least 6 net square feet (0.56 m^2) per occupant shall be provided on each side of each smoke barrier for the total number of occupants in adjoining smoke compartments. This space shall be readily available wher-

ever the occupants are moved across the smoke barrier in a fire emergency.

408.6.3 Independent egress. A means of egress shall be provided from each smoke compartment created by smoke barriers without having to return through the smoke compartment from which means of egress originates.

408.7 Subdivision of resident housing areas. Sleeping areas and any contiguous day room, group activity space or other common spaces where residents are housed shall be separated from other spaces in accordance with Sections 408.7.1 through 408.7.4.

408.7.1 Occupancy Conditions 3 and 4. Each sleeping area in Occupancy Conditions 3 and 4 shall be separated from the adjacent common spaces by a smoke-tight partition where the travel distance from the sleeping area through the common space to the corridor exceeds 50 feet (15 240 mm).

408.7.2 Occupancy Condition 5. Each sleeping area in Occupancy Condition 5 shall be separated from adjacent sleeping areas, corridors and common spaces by a smoke-tight partition. Additionally, common spaces shall be separated from the corridor by a smoke-tight partition.

408.7.3 Openings in room face. The aggregate area of openings in a solid sleeping room face in Occupancy Conditions 2, 3, 4 and 5 shall not exceed 120 square inches (77 419 mm²). The aggregate area shall include all openings including door undercuts, food passes and grilles. Openings shall be not more than 36 inches (914 mm) above the floor. In Occupancy Condition 5, the openings shall be closeable from the room side.

408.7.4 Smoke-tight doors. Doors in openings in partitions required to be smoke tight by Section 408.7 shall be substantial doors, of construction that will resist the passage of smoke. Latches and door closures are not required on cell doors.

408.8 Windowless buildings. For the purposes of this section, a windowless building or portion of a building is one with nonopenable windows, windows not readily breakable or without windows. Windowless buildings shall be provided with an engineered smoke control system to provide ventilation (mechanical or natural) in accordance with Section 909 for each windowless smoke compartment.

SECTION 409 MOTION PICTURE PROJECTION ROOMS

409.1 General. The provisions of this section shall apply to rooms in which ribbon-type cellulose acetate or other safety film is utilized in conjunction with electric arc, xenon or other light-source projection equipment that develops hazardous gases, dust or radiation. Where cellulose nitrate film is utilized or stored, such rooms shall comply with NFPA 40.

409.1.1 Projection room required. Every motion picture machine projecting film as mentioned within the scope of this section shall be enclosed in a projection room. Appurtenant electrical equipment, such as rheostats, transformers

and generators, shall be within the projection room or in an adjacent room of equivalent construction.

409.2 Construction of projection rooms. Every projection room shall be of permanent construction consistent with the construction requirements for the type of building in which the projection room is located. Openings are not required to be protected.

The room shall have a floor area of not less than 80 square feet (7.44 m²) for a single machine and at least 40 square feet (3.7 m²) for each additional machine. Each motion picture projector, floodlight, spotlight or similar piece of equipment shall have a clear working space of not less than 30 inches by 30 inches (762 mm by 762 mm) on each side and at the rear thereof, but only one such space shall be required between two adjacent projectors. The projection room and the rooms appurtenant thereto shall have a ceiling height of not less than 7 feet 6 inches (2286 mm). The aggregate of openings for projection equipment shall not exceed 25 percent of the area of the wall between the projection room and the auditorium. Openings shall be provided with glass or other approved material, so as to close completely the opening.

409.3 Projection room and equipment ventilation. Ventilation shall be provided in accordance with the *Florida Building Code, Mechanical*.

409.3.1 Supply air. Each projection room shall be provided with adequate air supply inlets so arranged as to provide well-distributed air throughout the room. Air inlet ducts shall provide an amount of air equivalent to the amount of air being exhausted by projection equipment. Air is permitted to be taken from the outside; from adjacent spaces within the building, provided the volume and infiltration rate is sufficient; or from the building air-conditioning system, provided it is so arranged as to provide sufficient air when other systems are not in operation.

409.3.2 Exhaust air. Projection rooms are permitted to be exhausted through the lamp exhaust system. The lamp exhaust system shall be positively interconnected with the lamp so that the lamp will not operate unless there is the required airflow. Exhaust air ducts shall terminate at the exterior of the building in such a location that the exhaust air cannot be readily recirculated into any air supply system. The projection room ventilation system is permitted to also serve appurtenant rooms, such as the generator and rewind rooms.

409.3.3 Projection machines. Each projection machine shall be provided with an exhaust duct that will draw air from each lamp and exhaust it directly to the outside of the building. The lamp exhaust is permitted to serve to exhaust air from the projection room to provide room air circulation. Such ducts shall be of rigid materials, except for a flexible connector approved for the purpose. The projection lamp or projection room exhaust system, or both, is permitted to be combined but shall not be interconnected with any other exhaust or return system, or both, within the building.

409.4 Lighting control. Provisions shall be made for control of the auditorium lighting and the means of egress lighting systems of theaters from inside the projection room and from at least one other convenient point in the building.

409.5 Miscellaneous equipment. Each projection room shall be provided with rewind and film storage facilities.

SECTION 410 STAGES AND PLATFORMS

410.1 Applicability. The provisions of this section shall apply to all parts of buildings and structures that contain stages or platforms and similar appurtenances as herein defined.

410.2 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.

FLY GALLERY. A raised floor area above a stage from which the movement of scenery and operation of other stage effects are controlled.

GRIDIRON. The structural framing over a stage supporting equipment for hanging or flying scenery and other stage effects.

PINRAIL. A rail on or above a stage through which belaying pins are inserted and to which lines are fastened.

PLATFORM. A raised area within a building used for worship, the presentation of music, plays or other entertainment; the head table for special guests; the raised area for lecturers and speakers; boxing and wrestling rings; theater-in-the-round stages; and similar purposes wherein there are no overhead hanging curtains, drops, scenery or stage effects other than lighting and sound. A temporary platform is one installed for not more than 30 days.

PROSCENIUM WALL. The wall that separates the stage from the auditorium or assembly seating area.

STAGE. A space within a building utilized for entertainment or presentations, which includes overhead hanging curtains, drops, scenery or stage effects other than lighting and sound.

410.3 Stages. Stage construction shall comply with Sections 410.3.1 through 410.3.7.

410.3.1 Stage construction. Stages shall be constructed of materials as required for floors for the type of construction of the building in which such stages are located.

Exceptions:

1. Stages of Type IIB or IV construction with a nominal 2-inch (51 mm) wood deck, provided that the stage is separated from other areas in accordance with Section 410.3.4.
2. In buildings of Type IIA, IIIA and VA construction, a fire-resistance-rated floor is not required, provided the space below the stage is equipped with an automatic fire-extinguishing system in accordance with Section 903 or 904.
3. In all types of construction, the finished floor shall be constructed of wood or approved noncombustible materials. Openings through stage floors shall be equipped with tight-fitting, solid wood trap doors with approved safety locks.

410.3.1.1 Stage height and area. Stage areas shall be measured to include the entire performance area and

adjacent backstage and support areas not separated from the performance area by fire-resistance-rated construction. Stage height shall be measured from the lowest point on the stage floor to the highest point of the roof or floor deck above the stage.

410.3.2 Galleries, gridirons, catwalks and pinrails. Beams designed only for the attachment of portable or fixed theater equipment, gridirons, galleries and catwalks shall be constructed of approved materials consistent with the requirements for the type of construction of the building; and a fire-resistance rating shall not be required. These areas shall not be considered to be floors, stories, mezzanines or levels in applying this code.

Exception: Floors of fly galleries and catwalks shall be constructed of any approved material.

410.3.3 Exterior stage doors. Where protection of openings is required, exterior exit doors shall be protected with fire door assemblies that comply with Section 715. Exterior openings that are located on the stage for means of egress or loading and unloading purposes, and that are likely to be open during occupancy of the theater, shall be constructed with vestibules to prevent air drafts into the auditorium.

410.3.4 Proscenium wall. Where the stage height is greater than 50 feet (15 240 mm), all portions of the stage shall be completely separated from the seating area by a proscenium wall with not less than a 2-hour fire-resistance rating extending continuously from the foundation to the roof.

410.3.5 Proscenium curtain. Where a proscenium wall is required to have a fire-resistance rating, the stage opening shall be provided with a fire curtain of approved material or an approved water curtain complying with Section 903.3.1.1. The fire curtain shall be designed and installed to intercept hot gases, flames and smoke and to prevent a glow from a severe fire on the stage from showing on the auditorium side for a period of 20 minutes. The closing of the fire curtain from the full open position shall be accomplished in less than 30 seconds, with the last 8 feet (2438 mm) of travel requiring 5 or more seconds for full closure.

410.3.5.1 Activation. The curtain shall be activated by rate-of-rise heat detection installed in accordance with Section 907.10 operating at a rate of temperature rise of 15 to 20°F per minute (8 to 11°C per minute), and by an auxiliary manual control.

410.3.5.2 Fire test. A sample curtain with a minimum of two vertical seams shall be subjected to the standard fire test specified in ASTM E 119 for a period of 30 minutes. The curtain shall overlap the furnace edges by an amount that is appropriate to seal the top and sides. The curtain shall have a bottom pocket containing a minimum of 4 pounds per linear foot (5.9 kg/m) of batten. The exposed surface of the curtain shall not glow, and flame or smoke shall not penetrate the curtain during the test period. Unexposed surface temperature and hose stream test requirements are not applicable to the proscenium fire safety curtain test.

410.3.5.3 Smoke test. Curtain fabrics shall have a smoke-developed rating of 25 or less when tested in accordance with ASTM E 84.

410.3.5.4 Tests. The completed proscenium curtain shall be subjected to operating tests prior to the issuance of a certificate of occupancy.

410.3.6 Scenery. Combustible materials used in sets and scenery shall meet the fire propagation performance criteria of NFPA 701, in accordance with Section 806 and the *Florida Fire Prevention Code*. Foam plastics and materials containing foam plastics shall comply with Section 2603 and the *Florida Fire Prevention Code*.

410.3.7 Stage ventilation. Emergency ventilation shall be provided for stages larger than 1,000 square feet (93 m²) in floor area, or with a stage height greater than 50 feet (15 240 mm). Such ventilation shall comply with Section 410.3.7.1 or 410.3.7.2.

410.3.7.1 Roof vents. Two or more vents constructed to open automatically by approved heat-activated devices and with an aggregate clear opening area of not less than 5 percent of the area of the stage shall be located near the center and above the highest part of the stage area. Supplemental means shall be provided for manual operation of the ventilator. Curbs shall be provided as required for skylights in Section 2610.2. Vents shall be labeled.

[F] 410.3.7.2 Smoke control. Smoke control in accordance with Section 909 shall be provided to maintain the smoke layer interface not less than 6 feet (1829 mm) above the highest level of the assembly seating or above the top of the proscenium opening where a proscenium wall is provided in compliance with Section 410.3.4.

410.4 Platform construction. Permanent platforms shall be constructed of materials as required for the type of construction of the building in which the permanent platform is located. Permanent platforms are permitted to be constructed of fire-retardant-treated wood for Type I, II, and IV construction where the platforms are not more than 30 inches (762 mm) above the main floor, and not more than one-third of the room floor area and not more than 3,000 square feet (279 m²) in area. Where the space beneath the permanent platform is used for storage or any other purpose other than equipment, wiring or plumbing, the floor construction shall not be less than 1-hour fire-resistance-rated construction. Where the space beneath the permanent platform is used only for equipment, wiring or plumbing, the underside of the permanent platform need not be protected.

410.4.1 Temporary platforms. Platforms installed for a period of not more than 30 days are permitted to be constructed of any materials permitted by the code. The space between the floor and the platform above shall only be used for plumbing and electrical wiring to platform equipment.

410.5 Dressing and appurtenant rooms. Dressing and appurtenant rooms shall comply with Sections 410.5.1 through 410.5.3.

410.5.1 Separation from stage. Where the stage height is greater than 50 feet (15 240 mm), the stage shall be separated from dressing rooms, scene docks, property rooms, workshops, storerooms and compartments appurtenant to

the stage and other parts of the building by a fire barrier with not less than a 2-hour fire-resistance rating with approved opening protectives. For stage heights of 50 feet (15 240 mm) or less, the required stage separation shall be a fire barrier with not less than a 1-hour fire-resistance rating with approved opening protectives.

410.5.2 Separation from each other. Dressing rooms, scene docks, property rooms, workshops, storerooms and compartments appurtenant to the stage shall be separated from each other by fire barriers with not less than a 1-hour fire-resistance rating with approved opening protectives.

410.5.3 Stage exits. At least one approved means of egress shall be provided from each side of the stage and from each side of the space under the stage. At least one means of escape shall be provided from each fly gallery and from the gridiron. A steel ladder, alternating tread stairway or spiral stairway is permitted to be provided from the gridiron to a scuttle in the stage roof.

[F] 410.6 Automatic sprinkler system. Stages shall be equipped with an automatic fire-extinguishing system in accordance with Chapter 9. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such stages.

Exceptions:

1. Sprinklers are not required under stage areas less than 4 feet (1219 mm) in clear height that are utilized exclusively for storage of tables and chairs, provided the concealed space is separated from the adjacent spaces by not less than ⁵/₈-inch (15.9 mm) Type X gypsum board.
2. Sprinklers are not required for stages 1,000 square feet (93 m²) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on stages.

[F] 410.7 Standpipes. Standpipe systems shall be provided in accordance with Section 905.

SECTION 411 SPECIAL AMUSEMENT BUILDINGS

411.1 General. Special amusement buildings, regardless of occupant load, shall meet the requirements for assembly occupancies in addition to the requirements of Section 411.

Exception: Special amusement buildings that are multi-level play structures not more than 120 inches (3050 mm) in height and have aggregate horizontal projections not exceeding 160 square feet (15 m²).

411.2 Definition. The following word and term shall, for the purpose of this section and as used elsewhere in this code, have the meaning shown herein.

SPECIAL AMUSEMENT BUILDING. A special amusement building is any temporary or permanent building or portion thereof that is occupied for amusement, entertainment or educational purposes and that contains a device or system that conveys passengers or provides a walkway along, around or over a course in any direction so arranged that the means of egress path is not readily apparent due to visual or audio distractions or is intentionally confounded or is not readily available because of the nature of the attraction or mode of conveyance through the building or structure.

411.3 Automatic fire detection. Where the nature of the special amusement buildings is such that it operates in reduced lighting levels, special amusement buildings shall be equipped with an automatic fire detection system in accordance with Section 907.

411.4 Automatic sprinkler system. Special amusement buildings shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where the special amusement building is temporary, the sprinkler water supply shall be of an approved temporary means.

Exception: Automatic fire sprinklers are not required where special amusement buildings or structures do not exceed 120 inches (3050 mm) in height and do not exceed 160 square feet (15 m²) in aggregate horizontal projection.

[F] 411.5 Alarm. Actuation of a single smoke detector, the automatic sprinkler system or other automatic fire detection device shall immediately sound an alarm at the building at a constantly attended location from which emergency action can be initiated including the capability of manual initiation of requirements in Section 907.2.11.2.

[F] 411.6 Emergency voice/alarm communications system. An emergency voice/alarm communications system shall be provided in accordance with Sections 907.2.11 and 907.2.12.2, which is also permitted to serve as a public address system and shall be audible throughout the entire special amusement building.

411.7 Exit marking. Exit signs shall be installed at the required exit or exit access doorways of amusement buildings. Approved directional exit markings shall also be provided. Where mirrors, mazes or other designs are utilized that disguise the path of egress travel such that they are not apparent, approved low-level exit signs and directional path markings shall be provided and located not more than 8 inches (203 mm) above the walking surface and on or near the path of egress travel. Such markings shall become visible in an emergency. The directional exit marking shall be activated by the automatic fire detection system and the automatic sprinkler system in accordance with Section 907.2.11.2.

411.8 Interior finish. The interior finish shall be Class A in accordance with Section 803.1.

SECTION 412 AIRCRAFT-RELATED OCCUPANCIES

412.1 Airport traffic control towers.

412.1.1 General. The provisions of this section shall apply to airport traffic control towers not exceeding 1,500 square feet (140 m²) per floor occupied only for the following uses:

1. Airport traffic control cab.
2. Electrical and mechanical equipment rooms.
3. Airport terminal radar and electronics rooms.
4. Office spaces incidental to the tower operation.
5. Lounges for employees, including sanitary facilities.

412.1.2 Type of construction. Airport traffic control towers shall be constructed to comply with the height and area limitations of Table 412.1.2.

**TABLE 412.1.2
HEIGHT AND AREA LIMITATIONS FOR AIRPORT
TRAFFIC CONTROL TOWERS**

TYPE OF CONSTRUCTION	HEIGHT ^a (feet)	MAXIMUM AREA (square feet)
IA	Unlimited	1,500
IB	240	1,500
IIA	100	1,500
IIB	85	1,500
IIIA	65	1,500

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

a. Height to be measured from grade plane to cab floor.

412.1.3 Egress. A minimum of one exit stairway shall be permitted for airport traffic control towers of any height provided that the occupant load per floor does not exceed 15. The stairway shall conform to the requirements of Section 1009. The stairway shall be separated from elevators by a minimum distance of one-half of the diagonal of the area served measured in a straight line. The exit stairway and elevator hoistway are permitted to be located in the same shaft enclosure, provided they are separated from each other by a 4-hour fire barrier having no openings. Such stairway shall be pressurized to a minimum of 0.15 inch of water column (43 Pa) and a maximum of 0.35 inch of water column (101 Pa) in the shaft relative to the building with stairway doors closed. Stairways need not extend to the roof as specified in Section 1009.11. The provisions of Section 403 do not apply.

Exception: Smokeproof enclosures as set forth in Section 1020.1.7 are not required where required stairways are pressurized.

[F] 412.1.4 Automatic fire detection systems. Airport traffic control towers shall be provided with an automatic fire detection system installed in accordance with Section 907.2.

[F] 412.1.5 Standby power. A standby power system that conforms to Section 2702 shall be provided in airport traffic control towers more than 65 feet (19 812 mm) in height. Power shall be provided to the following equipment:

1. Pressurization equipment, mechanical equipment and lighting.
2. Elevator operating equipment.
3. Fire alarm and smoke detection systems.

412.1.6 Accessibility shall be in accordance with Chapter 11.

412.2 Aircraft hangars. Aircraft hangars shall be in accordance with Sections 412.2.1 through 412.2.6.

412.2.1 Exterior walls. Exterior walls located less than 30 feet (9 144 mm) lot lines or a public way shall have a fire-resistance rating not less than 2 hours.

412.2.2 Basements. Where hangars have basements, the floor over the basement shall be of Type IA construction and shall be made tight against seepage of water, oil or vapors. There shall be no opening or communication between the basement and the hangar. Access to the basement shall be from outside only.

412.2.3 Floor surface. Floors shall be graded and drained to prevent water or fuel from remaining on the floor. Floor drains shall discharge through an oil separator to the sewer or to an outside vented sump.

Exception: Aircraft hangars with individual lease spaces not exceeding 2,000 square feet (186 m²) each in which servicing, repairing or washing is not conducted and fuel is not dispensed shall have floors that are graded toward the door, but shall not require a separator.

412.2.4 Heating equipment. Heating equipment shall be placed in another room separated by 2-hour fire-resistance-rated construction. Entrance shall be from the outside or by means of a vestibule providing a two-doorway separation.

Exceptions:

1. Unit heaters and vented infrared radiant heating equipment suspended at least 10 feet (3048 mm) above the upper surface of wings or engine enclosures of the highest aircraft that are permitted to be housed in the hangar and at least 8 feet (2438 mm) above the floor in shops, offices and other sections of the hangar communicating with storage or service areas.
2. A single interior door shall be allowed, provided the sources of ignition in the appliances are at least 18 inches (457 mm) above the floor.

412.2.5 Finishing. The process of “doping,” involving use of a volatile flammable solvent, or of painting, shall be carried on in a separate detached building equipped with automatic fire-extinguishing equipment in accordance with Section 903.

[F] **412.2.6 Fire suppression.** Aircraft hangars shall be provided with fire suppression as required by NFPA 409.

Exception: Group II hangars as defined in NFPA 409 storing private aircraft without major maintenance or overhaul are exempt from foam suppression requirements.

412.3 Residential aircraft hangars. Residential aircraft hangars as defined in Section 412.3.1 shall comply with Sections 412.3.2 through 412.3.6.

412.3.1 Definition. The following word and term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

RESIDENTIAL AIRCRAFT HANGAR. An accessory building less than 2,000 square feet (186 m²) and 20 feet (6096 mm) in height, constructed on a one- or two-family residential property where aircraft are stored. Such use will be considered as a residential accessory use incidental to the dwelling.

412.3.2 Fire separation. A hangar shall not be attached to a dwelling unless separated by a fire barrier having a fire-resistance rating of not less than 1 hour. Such separation shall be continuous from the foundation to the underside of the roof and unpierced except for doors leading to the dwelling unit. Doors into the dwelling unit must be equipped with self-closing devices and conform to the requirements of Section 715 with at least a 4-inch (102 mm) noncombustible raised sill. Openings from a hanger directly into a room used for sleeping purposes shall not be permitted.

412.3.3 Egress. A hangar shall provide two means of egress. One of the doors into the dwelling shall be considered as meeting only one of the two means of egress.

[F] **412.3.4 Smoke alarms.** Smoke alarms shall be provided within the hangar in accordance with Section 907.2.21.

412.3.5 Independent systems. Electrical, mechanical and plumbing drain, waste and vent (DWV) systems installed within the hangar shall be independent of the systems installed within the dwelling. Building sewer lines shall be permitted to be connect outside the structures.

Exception: Smoke detector wiring and feed for electrical subpanels in the hangar.

412.3.6 Height and area limits. Residential aircraft hangars shall not exceed 2,000 square feet (186 m²) in area and 20 feet (6096 mm) in height.

[F] **412.4 Aircraft paint hangars.** Aircraft painting operations where flammable liquids are used in excess of the maximum allowable quantities per control area listed in Table 307.7(1) shall be conducted in an aircraft paint hangar that complies with the provisions of Section 412.4.

[F] **412.4.1 Occupancy group.** Aircraft paint hangars shall be classified as Group H-2. Aircraft paint hangars shall comply with the applicable requirements of this code and the *Florida Fire Prevention Code* for such occupancy.

412.4.2 Construction. The aircraft paint hangar shall be of Type I or II construction.

[F] **412.4.3 Operations.** Only those flammable liquids necessary for painting operations shall be permitted in quantities less than the maximum allowable quantities per control area in Table 307.1(1). Spray equipment cleaning operations shall be conducted in a liquid use, dispensing and mixing room.

[F]412.4.4 Storage. Storage of flammable liquids shall be in a liquid storage room.

[F] 412.4.5 Fire suppression. Aircraft paint hangars shall be provided with fire suppression as required by NFPA 409.

412.4.6 Ventilation. Aircraft paint hangars shall be provided with ventilation as required in the *Florida Building Code, Mechanical*.

412.5 Heliports and helistops. Heliports and helistops shall be permitted to be erected on buildings or other locations where they are constructed in accordance with this section.

412.5.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

HELIPORT. An area of land or water or a structural surface that is used, or intended for use, for the landing and taking off of helicopters, and any appurtenant areas that are used, or intended for use, for heliport buildings and other heliport facilities.

HELISTOP. The same as a “Heliport,” except that no fueling, defueling, maintenance, repairs or storage of helicopters is permitted.

412.5.2 Size. The landing area for helicopters less than 3,500 pounds (1588 kg) shall be a minimum of 20 feet (6096 mm) in length and width. The landing area shall be surrounded on all sides by a clear area having a minimum average width at roof level of 15 feet (4572 mm) but with no width less than 5 feet (1524 mm).

412.5.3 Design. Helicopter landing areas and the supports thereof on the roof of a building shall be noncombustible construction. Landing areas shall be designed to confine any flammable liquid spillage to the landing area itself and provisions shall be made to drain such spillage away from any exit or stairway serving the helicopter landing area or from a structure housing such exit or stairway. For structural design requirements, see Section 1605.5.

412.5.4 Means of egress. The means of egress from heliports and helistops shall comply with the provisions of Chapter 10. Landing areas located on buildings or structures shall have two or more means of egress. For landing areas less than 60 feet (18 288 mm) in length, or less than 2,000 square feet (186 m²) in area, the second means of egress may be a fire escape or ladder leading to the floor below.

412.5.5 Rooftop heliports and helistops. Rooftop heliports and helistops shall comply with NFPA 418.

SECTION 413 COMBUSTIBLE STORAGE

413.1 General. High-piled stock or rack storage in any occupancy group shall comply with the *Florida Fire Prevention Code*.

413.2 Attic, under-floor and concealed spaces. Attic, under-floor and concealed spaces used for storage of combustible materials shall be protected on the storage side as required for 1-hour fire-resistance-rated construction. Openings shall be protected by assemblies that are self-closing and are of

noncombustible construction or solid wood core not less than 1³/₄ inch (45 mm) in thickness.

Exceptions:

1. Areas protected by approved automatic sprinkler systems.
2. Group R-3 and U occupancies.

SECTION 414 HAZARDOUS MATERIALS

[F] 414.1 General. The provisions of this section shall apply to buildings and structures occupied for the manufacturing, processing, dispensing, use or storage of hazardous materials.

[F] 414.1.1 Other provisions. Buildings and structures with an occupancy in Group H shall also comply with the applicable provisions of Section 415 and the *Florida Fire Prevention Code*.

[F] 414.1.2 Materials. The safe design of hazardous material occupancies is material dependent. Individual material requirements are also found in Sections 307 and 415, and in the *Florida Building Code, Mechanical* and the *Florida Fire Prevention Code*.

[F] 414.1.2.1 Aerosols. Level 2 and 3 aerosol products shall be stored and displayed in accordance with the *Florida Fire Prevention Code*. See Section 311.2 and the *Florida Fire Prevention Code* for occupancy group requirements.

[F] 414.1.3 Information required. Separate floor plans shall be submitted for buildings and structures with an occupancy in Group H, identifying the locations of anticipated contents and processes so as to reflect the nature of each occupied portion of every building and structure. A report identifying hazardous materials including, but not limited to, materials representing hazards that are classified in Group H to be stored or used, shall be submitted and the methods of protection from such hazards shall be indicated on the construction documents. The opinion and report shall be prepared by a qualified person, firm or corporation approved by the building official and shall be provided without charge to the enforcing agency.

[F] 414.2 Control areas. Control areas shall comply with Sections 414.2.1 through 414.2.5 and the *Florida Fire Prevention Code*.

414.2.1 Construction requirements. Control areas shall be separated from each other by fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

[F] 414.2.2 Percentage of maximum allowable quantities. The percentage of maximum allowable quantities of hazardous materials per control area permitted at each floor level within a building shall be in accordance with Table 414.2.2.

[F] 414.2.3 Number. The maximum number of control areas within a building shall be in accordance with Table 414.2.2.

[F] TABLE 414.2.2
DESIGN AND NUMBER OF CONTROL AREAS

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA ^a	NUMBER OF CONTROL AREAS PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS ^b
Above grade plane	Higher than 9	5	1	2
	7-9	5	2	2
	6	12.5	2	2
	5	12.5	2	2
	4	12.5	2	2
	3	50	2	1
	2	75	3	1
Below grade plane	1	100	4	1
	1	75	3	1
	2	50	2	1
	Lower than 2	Not Allowed	Not Allowed	Not Allowed

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 307.1(1) and 307.1(2), with all increases allowed in the notes to those tables.

b. Fire barriers shall include walls and floors as necessary to provide separation from other portions of the building.

414.2.4 Fire-resistance-rating requirements. The required fire-resistance rating for fire barriers shall be in accordance with Table 414.2.2. The floor construction of the control area and the construction supporting the floor of the control area shall have a minimum 2-hour fire-resistance rating.

Exception: The floor construction of the control area and the construction supporting the floor of the control area are allowed to be 1-hour fire-resistance rated in buildings of Type IIA, IIIA and VA construction, provided that both of the following conditions exist:

1. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, and
2. The building is three stories or less in height.

[F] 414.2.5 Hazardous material in Group M display and storage areas and in Group S storage areas. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials permitted within a single control area of a Group M display and storage area, a Group S storage area or an outdoor control area is permitted to exceed the maximum allowable quantities per control area specified in Tables 307.1(1) and 307.1(2) without classifying the building or use as a Group H occupancy, provided that the materials are displayed and stored in accordance with the *Florida Fire Prevention Code* and quantities do not exceed the maximum allowable specified in Table 414.2.5(1).

In Group M occupancy wholesale and retail sales uses, indoor storage of flammable and combustible liquids shall not exceed the maximum allowable quantities per control area as indicated in Table 414.2.5(2), provided that the materials are displayed and stored in accordance with the *Florida Fire Prevention Code*.

The maximum quantity of aerosol products in Group M occupancy retail display areas, storage areas adjacent to retail display areas and retail storage areas shall be in accordance with the *Florida Fire Prevention Code*.

[F] 414.3 Ventilation. Rooms, areas or spaces of Group H in which explosive, corrosive, combustible, flammable or highly toxic dusts, mists, fumes, vapors or gases are or may be emitted due to the processing, use, handling or storage of materials shall be mechanically ventilated as required by the *Florida Fire Prevention Code* and the *Florida Building Code, Mechanical*.

Ducts conveying explosives or flammable vapors, fumes or dusts shall extend directly to the exterior of the building without entering other spaces. Exhaust ducts shall not extend into or through ducts and plenums.

Exception: Ducts conveying vapor or fumes having flammable constituents less than 25 percent of their lower flammable limit (LFL) are permitted to pass through other spaces.

Emissions generated at workstations shall be confined to the area in which they are generated as specified in the *Florida Fire Prevention Code* and the *Florida Building Code, Mechanical*.

The location of supply and exhaust openings shall be in accordance with the *Florida Building Code, Mechanical*. Exhaust air contaminated by highly toxic material shall be treated in accordance with the *Florida Fire Prevention Code*.

A manual shutoff control for ventilation equipment required by this section shall be provided outside the room adjacent to the principal access door to the room. The switch shall be of the break-glass type and shall be labeled: VENTILATION SYSTEM EMERGENCY SHUTOFF.

[F] 414.4 Hazardous material systems. Systems involving hazardous materials shall be suitable for the intended application. Controls shall be designed to prevent materials from entering or leaving process or reaction systems at other than the intended time, rate or path. Automatic controls, where provided, shall be designed to be fail safe.

[F] 414.5 Inside storage, dispensing and use. The inside storage, dispensing and use of hazardous materials in excess of the maximum allowable quantities per control area of Tables 307.1(1) and 307.1(2) shall be in accordance with Sections

[F] TABLE 414.2.5(1)
 MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES
 NONFLAMMABLE SOLIDS AND NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS^{d,e,f}

CONDITION		MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
Material ^a	Class	Solids pounds	Liquids gallons
A. Health-hazard materials—nonflammable and noncombustible solids and liquids			
1. Corrosives ^{b,c}	Not Applicable	9,750	975
2. Highly toxics	Not Applicable	20 ^{b,c}	2 ^{b,c}
3. Toxics ^{b,c}	Not Applicable	1,000	100
B. Physical-hazard materials—nonflammable and noncombustible solids and liquids			
1. Oxidizers ^{b,c}	4	Not Allowed	Not Allowed
	3	1,150 ^g	115
	2	2,250 ^h	225
	1	18,000 ^{i,j}	1,800 ^{i,j}
2. Unstable (reactives) ^{b,c}	4	Not Allowed	Not Allowed
	3	550	55
	2	1,150	115
	1	Not Limited	Not Limited
3. Water (reactives)	3 ^{b,c}	550	55
	2 ^{b,c}	1,150	115
	1	Not Limited	Not Limited

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L.

- a. Hazard categories are as specified in the *Florida Fire Prevention Code*.
- b. Maximum allowable quantities shall be increased 100 percent in buildings that are sprinklered in accordance with Section 903.3.1.1. When Note c also applies, the increase for both notes shall be applied cumulatively.
- c. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, in accordance with the *Florida Fire Prevention Code*. When Note b also applies, the increase for both notes shall be applied cumulatively.
- d. See Table 414.2.2 for design and number of control areas.
- e. Allowable quantities for other hazardous material categories shall be in accordance with Section 307.
- f. Maximum quantities shall be increased 100 percent in outdoor control areas.
- g. Maximum amounts are permitted to be increased to 2,250 pounds when individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
- h. Maximum amounts are permitted to be increased to 4,500 pounds when individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
- i. 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.
- j. Quantities are unlimited in an outdoor control area.

TABLE [F] 414.2.5(2)
 MAXIMUM ALLOWABLE QUANTITY OF FLAMMABLE AND COMBUSTIBLE LIQUIDS
 IN WHOLESALE AND RETAIL SALES OCCUPANCIES PER CONTROL AREA^a

TYPE OF LIQUID	MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA (gallons)		
	Sprinklered in accordance with Note B densities and arrangements	Sprinklered in accordance with Tables 3404.3.6.3(4) through 3404.3.6.3(8) and Table 3404.3.7.5.1 of the <i>Florida Fire Prevention Code</i>	Nonsprinklered
Class IA	60	60	30
Class IB, IC, II and IIIA	7,500 ^c	15,000 ^c	1,600
Class IIIB	Unlimited	Unlimited	13,200

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m², 1 gallon = 3.785 L, 1 gallon per minute per square foot = 40.75 L/min/m².

- a. Control areas shall be separated from each other by not less than a 1-hour fire barrier wall.
- b. To be considered as sprinklered, a building shall be equipped throughout with an approved automatic sprinkler system with a design providing minimum densities as follows:
 - 1. For uncartoned commodities on shelves 6 feet or less in height where the ceiling height does not exceed 18 feet, quantities are those permitted with a minimum sprinkler design density of Ordinary Hazard Group 2.
 - 2. For cartoned, palletized or racked commodities where storage is 4 feet 6 inches or less in height and where the ceiling height does not exceed 18 feet, quantities are those permitted with a minimum sprinkler design density of 0.21 gallon per minute per square foot over the most remote 1,500-square-foot area.
- c. Where wholesale and retail sales or storage areas exceed 50,000 square feet in area, the maximum allowable quantities are allowed to be increased by 2 percent for each 1,000 square feet of area in excess of 50,000 square feet, up to a maximum of 100 percent of the table amounts. A control area separation is not required. The cumulative amounts, including amounts attained by having an additional control area, shall not exceed 30,000 gallons.

414.5.1 through 414.5.5 of this code and the *Florida Fire Prevention Code*.

[F] 414.5.1 Explosion control. Explosion control shall be provided in accordance with the *Florida Fire Prevention Code* as required by Table 414.5.1 where quantities of hazardous materials specified in that table exceed the maximum allowable quantities in Table 307.1(1) or where a structure, room or space is occupied for purposes involving explosion hazards as required by Section 415 or the *Florida Fire Prevention Code*.

[F] 414.5.2 Monitor control equipment. Monitor control equipment shall be provided where required by the *Florida Fire Prevention Code*.

[F] 414.5.3 Automatic fire detection systems. Group H occupancies shall be provided with an automatic fire detection system in accordance with Section 907.2.

[F] 414.5.4 Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required, such systems shall be provided with an emergency or standby power system in accordance with this code or Chapter 27 of the *Florida Building Code, Building*.

Exceptions:

1. Storage areas for Class I and II oxidizers.
2. Storage areas for Class III, IV and V organic peroxides.
3. Storage, use and handling areas for highly toxic or toxic materials as provided for in the *Florida Fire Prevention Code*.
4. Standby power for mechanical ventilation, treatment systems and temperature control systems shall not be required where an approved fail-safe engineered system is installed.

[F] 414.5.5 Spill control, drainage and containment. Rooms, buildings or areas occupied for the storage of solid and liquid hazardous materials shall be provided with a means to control spillage and to contain or drain off spillage and fire protection water discharged in the storage area where required in the *Florida Fire Prevention Code*. The methods of spill control shall be in accordance with the *Florida Fire Prevention Code*.

[F] 414.6 Outdoor storage, dispensing and use. The outdoor storage, dispensing and use of hazardous materials shall be in accordance with the *Florida Fire Prevention Code*.

[F] 414.6.1 Weather protection. Where weather protection is provided for sheltering outdoor hazardous material storage or use areas, such areas shall be considered outdoor storage or use when the weather protection structure complies with Sections 414.6.1.1 through 414.6.1.3.

[F] 414.6.1.1 Walls. Walls shall not obstruct more than one side of the structure.

Exception: Walls shall be permitted to obstruct portions of multiple sides of the structure, provided that the obstructed area does not exceed 25 percent of the structure's perimeter.

[F] 414.6.1.2 Separation distance. The distance from the structure to buildings, lot lines, public ways or means of egress to a public way shall not be less than the distance required for an outside hazardous material storage or use area without weather protection.

[F] 414.6.1.3 Noncombustible construction. The overhead structure shall be of approved noncombustible construction with a maximum area of 1,500 square feet (140 m²).

Exception: The increases permitted by Section 506 apply.

[F] TABLE 414.5.1
EXPLOSION CONTROL REQUIREMENTS^a

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems ^b
HAZARD CATEGORY			
Combustible dusts ^c	—	Not Required	Required
Cryogenic flammables	—	Not Required	Required
Explosives	Division 1.1	Required	Not Required
	Division 1.2	Required	Not Required
	Division 1.3	Not Required	Required
	Division 1.4	Not Required	Required
	Division 1.5	Required	Not Required
	Division 1.6	Required	Not Required
Flammable gas	Gaseous	Not Required	Required
	Liquefied	Not Required	Required
Flammable liquid	IA ^d	Not Required	Required
	IB ^e	Not Required	Required
Organic peroxides	U	Required	Not Permitted
	I	Required	Not Permitted
Oxidizer liquids and solids	4	Required	Not Permitted
Pyrophoric gas	—	Not Required	Required
Unstable (reactive)	4	Required	Not Permitted
	3 Detonable	Required	Not Permitted
	3 Nondetonable	Not Required	Required
Water-reactive liquids and solids	3	Not Required	Required
	2 ^g	Not Required	Required
SPECIAL USES			
Acetylene generator rooms	—	Not Required	Required
Grain processing	—	Not Required	Required
Liquefied petroleum gas- distribution facilities	—	Not Required	Required
Where explosion hazards exist ^f	Detonation	Required	Not Permitted
	Deflagration	Not Required	Required

a. See Section 414.1.3.

b. See the *Florida Fire Prevention Code*.

c. As generated during manufacturing or processing. See definition of “Combustible dust” in Chapter 3.

d. Storage or use.

e. In open use or dispensing.

f. Rooms containing dispensing and use of hazardous materials when an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.

g. A method of explosion control shall be provided when Class 2 water-reactive materials can form potentially explosive mixtures.

[F] 414.7 Emergency alarms. Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided as set forth herein.

[F] 414.7.1 Storage. An approved manual emergency alarm system shall be provided in buildings, rooms or areas used for storage of hazardous materials. Emergency alarm-initiating devices shall be installed outside of each interior exit or exit access door of storage buildings, rooms or areas. Activation of an emergency alarm-initiating device shall sound a local alarm to alert occupants of an emergency situation involving hazardous materials.

[F] 414.7.2 Dispensing, use and handling. Where hazardous materials having a hazard ranking of 3 or 4 in accor-

dance with NFPA 704 are transported through corridors or exit enclosures, there shall be an emergency telephone system, a local manual alarm station or an approved alarm-initiating device at not more than 150-foot (45 720 mm) intervals and at each exit and exit access doorway throughout the transport route. The signal shall be relayed to an approved central, proprietary or remote station service or constantly attended on-site location and shall also initiate a local audible alarm.

[F] 414.7.3 Supervision. Emergency alarm systems shall be supervised by an approved central, proprietary or remote station service or shall initiate an audible and visual signal at a constantly attended on-site location.

SECTION 415 GROUPS H-1, H-2, H-3, H-4 AND H-5

[F] 415.1 Scope. The provisions of this section shall apply to the storage and use of hazardous materials in excess of the maximum allowable quantities per control area listed in Section 307.1. Buildings and structures with an occupancy in Group H shall also comply with the applicable provisions of Section 414 and the *Florida Fire Prevention Code*.

[F] 415.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the meanings shown herein.

[F] CONTINUOUS GAS-DETECTION SYSTEM. A gas detection system where the analytical instrument is maintained in continuous operation and sampling is performed without interruption. Analysis is allowed to be performed on a cyclical basis at intervals not to exceed 30 minutes.

[F] EMERGENCY CONTROL STATION. An approved location on the premises where signals from emergency equipment are received and which is staffed by trained personnel.

[F] EXHAUSTED ENCLOSURE. An appliance or piece of equipment that consists of a top, a back and two sides providing a means of local exhaust for capturing gases, fumes, vapors and mists. Such enclosures include laboratory hoods, exhaust fume hoods and similar appliances and equipment used to locally retain and exhaust the gases, fumes, vapors and mists that could be released. Rooms or areas provided with general ventilation, in themselves, are not exhausted enclosures.

[F] FABRICATION AREA. An area within a semiconductor fabrication facility and related research and development areas in which there are processes using hazardous production materials. Such areas are allowed to include ancillary rooms or areas such as dressing rooms and offices that are directly related to the fabrication area processes.

[F] FLAMMABLE VAPORS OR FUMES. The concentration of flammable constituents in air that exceed 25 percent of their lower flammable limit (LFL).

[F] GAS CABINET. A fully enclosed, noncombustible enclosure used to provide an isolated environment for compressed gas cylinders in storage or use. Doors and access ports for exchanging cylinders and accessing pressure-regulating controls are allowed to be included.

[F] GAS ROOM. A separately ventilated, fully enclosed room in which only compressed gases and associated equipment and supplies are stored or used.

[F] HAZARDOUS PRODUCTION MATERIAL (HPM). A solid, liquid or gas associated with semiconductor manufacturing that has a degree-of-hazard rating in health, flammability or reactivity of Class 3 or 4 as ranked by NFPA 704 and which is used directly in research, laboratory or production processes that have as their end product materials that are not hazardous.

[F] HPM FLAMMABLE LIQUID. An HPM liquid that is defined as either a Class I flammable liquid or a Class II or Class IIIA combustible liquid.

[F] HPM ROOM. A room used in conjunction with or serving a Group H-5 occupancy, where HPM is stored or used and which is classified as a Group H-2, H-3 or H-4 occupancy.

[F] IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH). The concentration of air-borne contaminants which poses a threat of death, immediate or delayed permanent adverse health effects, or effects that could prevent escape from such an environment. This contaminant concentration level is established by the National Institute of Occupational Safety and Health (NIOSH) based on both toxicity and flammability. It generally is expressed in parts per million by volume (ppm v/v) or milligrams per cubic meter (mg/m³). If adequate data do not exist for precise establishment of IDLH concentrations, an independent certified industrial hygienist, industrial toxicologist, appropriate regulatory agency or other source approved by the code official shall make such determination.

[F] LIQUID. A material that has a melting point that is equal to or less than 68°F (20°C) and a boiling point that is greater than 68°F (20°C) at 14.7 pounds per square inch absolute (psia) (101 kPa). When not otherwise identified, the term “liquid” includes both flammable and combustible liquids.

[F] LIQUID STORAGE ROOM. A room classified as a Group H-3 occupancy used for the storage of flammable or combustible liquids in a closed condition.

[F] LIQUID USE, DISPENSING AND MIXING ROOM. A room in which Class I, II and IIIA flammable or combustible liquids are used, dispensed or mixed in open containers.

[F] LOWER FLAMMABLE LIMIT (LFL). The minimum concentration of vapor in air at which propagation of flame will occur in the presence of an ignition source. The LFL is sometimes referred to as “LEL” or “lower explosive limit.”

[F] NORMAL TEMPERATURE AND PRESSURE (NTP). A temperature of 70°F (21°C) and a pressure of 1 atmosphere [14.7 psia (101 kPa)].

[F] PHYSIOLOGICAL WARNING THRESHOLD LEVEL. A concentration of air-borne contaminants, normally expressed in parts per million (ppm) or milligrams per cubic meter, that represents the concentration at which persons can sense the presence of the contaminant due to odor, irritation or other quick-acting physiological response. When used in conjunction with the permissible exposure limit (PEL) the physiological warning threshold levels are those consistent with the classification system used to establish the PEL. See the definition of “Permissible exposure limit (PEL)” in the *Florida Fire Prevention Code*.

[F] SERVICE CORRIDOR. A fully enclosed passage used for transporting HPM and purposes other than required means of egress.

[F] SOLID. A material that has a melting point, decomposes or sublimates at a temperature greater than 68°F (20°C).

[F] STORAGE, HAZARDOUS MATERIALS.

1. The keeping, retention or leaving of hazardous materials in closed containers, tanks, cylinders or similar vessels, or
2. Vessels supplying operations through closed connections to the vessel.

[F] USE (MATERIAL). Placing a material into action, including solids, liquids and gases.

[F] WORKSTATION. A defined space or an independent principal piece of equipment using HPM within a fabrication area where a specific function, laboratory procedure or research activity occurs. Approved or listed hazardous materials storage cabinets, flammable liquid storage cabinets or gas cabinets serving a workstation are included as part of the workstation. A workstation is allowed to contain ventilation equipment, fire protection devices, detection devices, electrical devices and other processing and scientific equipment.

[F] 415.3 Fire separation distance. Group H occupancies shall be located on property in accordance with the other provisions of this chapter. In Groups H-2 and H-3, not less than 25 percent of the perimeter wall of the occupancy shall be an exterior wall.

Exceptions:

1. Liquid use, dispensing and mixing rooms having a floor area of not more than 500 square feet (46.5 m²) need not be located on the outer perimeter of the building where they are in accordance with the *Florida Fire Prevention Code* and NFPA 30.
2. Liquid storage rooms having a floor area of not more than 1,000 square feet (93 m²) need not be located on the outer perimeter where they are in accordance with the *Florida Fire Prevention Code* and NFPA 30.
3. Spray paint booths that comply with the *Florida Fire Prevention Code* need not be located on the outer perimeter.

[F] 415.3.1 Group H occupancy minimum fire separation distance. Regardless of any other provisions, buildings containing Group H occupancies shall be set back to the minimum fire separation distance as set forth in Items 1 through 4 below. Distances shall be measured from the walls enclosing the occupancy to lot lines, including those on a public way. Distances to assumed lot lines established for the purpose of determining exterior wall and opening protection are not to be used to establish the minimum fire separation distance for buildings on sites where explosives are manufactured or used when separation is provided in accordance with the quantity distance tables specified for explosive materials in the *Florida Fire Prevention Code*.

1. Group H-1. Not less than 75 feet (22 860 mm) and not less than required by the *Florida Fire Prevention Code*.

Exceptions:

1. Fireworks manufacturing buildings separated in accordance with NFPA 1124.
2. Buildings containing the following materials when separated in accordance with Table 415.3.1:
 - 2.1. Organic peroxides, unclassified detonable.
 - 2.2. Unstable reactive materials, Class 4.
 - 2.3. Unstable reactive materials, Class 3 detonable.
 - 2.4. Detonable pyrophoric materials.

2. Group H-2. Not less than 30 feet (9144 mm) where the area of the occupancy exceeds 1,000 square feet (93 m²) and it is not required to be located in a detached building.
3. Groups H-2 and H-3. Not less than 50 feet (15 240 mm) where a detached building is required (see Table 415.3.2).
4. Groups H-2 and H-3. Occupancies containing materials with explosive characteristics shall be separated as required by the *Florida Fire Prevention Code*. Where separations are not specified, the distances required shall not be less than the distances required by Table 415.3.1.

[F] 415.3.2 Group H-1 and H-2 or H-3 detached buildings. Where a detached building is required by Table 415.3.2, there are no requirements for wall and opening protection based on fire separation distance.

[F] 415.4 Special provisions for Group H-1 occupancies. Group H-1 occupancies shall be in buildings used for no other purpose, shall not exceed one story in height and be without a basement, crawl spaces or other under-floor spaces. Roofs shall be of lightweight construction with suitable thermal insulation to prevent sensitive material from reaching its decomposition temperature.

Group H-1 occupancies containing materials which are in themselves both physical and health hazards in quantities exceeding the maximum allowable quantities per control area in Table 307.1.(2) shall comply with requirements for both Group H-1 and H-4 occupancies.

[F] 415.4.1 Floors in storage rooms. Floors in storage areas for organic peroxides, pyrophoric materials and unstable (reactive) materials shall be of liquid-tight, noncombustible construction.

[F] 415.5 Special provisions for Group H-2 and H-3 occupancies. Group H-2 and H-3 occupancies containing quantities of hazardous materials in excess of those set forth in Table 415.3.2 shall be in buildings used for no other purpose, shall not exceed one story in height and shall be without basements, crawl spaces or other under-floor spaces.

Group H-2 and H-3 occupancies containing water-reactive materials shall be resistant to water penetration. Piping for conveying liquids shall not be over or through areas containing water reactives, unless isolated by approved liquid-tight construction.

Exception: Fire protection piping.

[F] 415.5.1 Floors in storage rooms. Floors in storage areas for organic peroxides, oxidizers, pyrophoric materials, unstable (reactive) materials and water-reactive solids and liquids shall be of liquid-tight, noncombustible construction.

[F] 415.5.2 Waterproof room. Rooms or areas used for the storage of water-reactive solids and liquids shall be constructed in a manner that resists the penetration of water through the use of waterproof materials. Piping carrying water for other than approved automatic fire sprinkler systems shall not be within such rooms or areas.

[F] TABLE 415.3.1
 MINIMUM SEPARATION DISTANCES FOR BUILDINGS CONTAINING EXPLOSIVE MATERIALS

QUANTITY OF EXPLOSIVE MATERIAL ^a		MINIMUM DISTANCE (feet)		
		Lot lines ^b and inhabited buildings ^c		Separation of magazines ^{d, e, f}
Pounds over	Pounds not over	Barricaded ^d	Unbarricaded	
2	5	70	140	12
5	10	90	180	16
10	20	110	220	20
20	30	125	250	22
30	40	140	280	24
40	50	150	300	28
50	75	170	340	30
75	100	190	380	32
100	125	200	400	36
125	150	215	430	38
150	200	235	470	42
200	250	255	510	46
250	300	270	540	48
300	400	295	590	54
400	500	320	640	58
500	600	340	680	62
600	700	355	710	64
700	800	375	750	66
800	900	390	780	70
900	1,000	400	800	72
1,000	1,200	425	850	78
1,200	1,400	450	900	82
1,400	1,600	470	940	86
1,600	1,800	490	980	88
1,800	2,000	505	1,010	90
2,000	2,500	545	1,090	98
2,500	3,000	580	1,160	104
3,000	4,000	635	1,270	116
4,000	5,000	685	1,370	122
5,000	6,000	730	1,460	130
6,000	7,000	770	1,540	136
7,000	8,000	800	1,600	144
8,000	9,000	835	1,670	150
9,000	10,000	865	1,730	156
10,000	12,000	875	1,750	164
12,000	14,000	885	1,770	174
14,000	16,000	900	1,800	180
16,000	18,000	940	1,880	188
18,000	20,000	975	1,950	196
20,000	25,000	1,055	2,000	210
25,000	30,000	1,130	2,000	224
30,000	35,000	1,205	2,000	238
35,000	40,000	1,340	2,000	248

(continued)

TABLE 415.3.1—continued
 MINIMUM SEPARATION DISTANCES FOR BUILDINGS CONTAINING EXPLOSIVE MATERIALS

QUANTITY OF EXPLOSIVE MATERIAL ^a		MINIMUM DISTANCE (feet)		
		Lot lines ^b and inhabited buildings ^c		Separation of magazines ^{d, e, f}
Pounds over	Pounds not over	Barricaded ^d	Unbarricaded	
40,000	45,000	1,340	2,000	258
45,000	50,000	1,400	2,000	270
50,000	55,000	1,460	2,000	280
55,000	60,000	1,515	2,000	290
60,000	65,000	1,565	2,000	300
65,000	70,000	1,610	2,000	310
70,000	75,000	1,655	2,000	320
75,000	80,000	1,695	2,000	330
80,000	85,000	1,730	2,000	340
85,000	90,000	1,760	2,000	350
90,000	95,000	1,790	2,000	360
95,000	100,000	1,815	2,000	370
100,000	110,000	1,835	2,000	390
110,000	120,000	1,855	2,000	410
120,000	130,000	1,875	2,000	430
130,000	140,000	1,890	2,000	450
140,000	150,000	1,900	2,000	470
150,000	160,000	1,935	2,000	490
160,000	170,000	1,965	2,000	510
170,000	180,000	1,990	2,000	530
180,000	190,000	2,010	2,010	550
190,000	200,000	2,030	2,030	570
200,000	210,000	2,055	2,055	590
210,000	230,000	2,100	2,100	630
230,000	250,000	2,155	2,155	670
250,000	275,000	2,215	2,215	720
275,000	300,000	2,275	2,275	770

For SI: 1 pound = 0.454 kg, 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

- a. The number of pounds of explosives listed is the number of pounds of trinitrotoluene (TNT) or the equivalent pounds of other explosive.
- b. The distance listed is the distance to lot line, including lot lines at public ways.
- c. For the purpose of this table, an inhabited building is any building on the same lot that is regularly occupied by people. Where two or more buildings containing explosives or magazines are located on the same lot, each building or magazine shall comply with the minimum distances specified from inhabited buildings and, in addition, they shall be separated from each other by not less than the distance shown for "Separation of magazines," except that the quantity of explosive materials contained in detonator buildings or magazines shall govern in regard to the spacing of said detonator buildings or magazines from buildings or magazines containing other explosive materials. If any two or more buildings or magazines are separated from each other by less than the specified "Separation of Magazines" distances, then such two or more buildings or magazines, as a group, shall be considered as one building or magazine, and the total quantity of explosive materials stored in such group shall be treated as if the explosive were in a single building or magazine located on the site of any building or magazine of the group, and shall comply with the minimum distance specified from other magazines or inhabited buildings.
- d. Barricades shall effectively screen the building containing explosives from other buildings, public ways or magazines. Where mounds or revetted walls of earth are used for barricades, they shall not be less than 3 feet in thickness. A straight line from the top of any side wall of the building containing explosive materials to the eave line of any other building, magazine or a point 12 feet above the centerline of a public way shall pass through the barricades.
- e. Magazine is a building or structure, other than an operating building, approved for storage of explosive materials. Portable or mobile magazines not exceeding 120 square feet (11 m²) in area need not comply with the requirements of this code, however, all magazines shall comply with the *Florida Fire Prevention Code*.
- f. The distance listed is permitted to be reduced by 50 percent where approved natural or artificial barriers are provided in accordance with the requirements in Note d.

[F] TABLE 415.3.2
REQUIRED DETACHED STORAGE

DETACHED STORAGE IS REQUIRED WHEN THE QUANTITY OF MATERIAL EXCEEDS THAT LISTED HEREIN			
Material	Class	Solids and Liquids (tons) ^{a,b}	Gases (cubic feet) ^{a,b}
Explosives	Division 1.1	Maximum Allowable Quantity	Not Applicable
	Division 1.2	Maximum Allowable Quantity	
	Division 1.3	Maximum Allowable Quantity	
	Division 1.4	Maximum Allowable Quantity	
	Division 1.4 ^c	1	
	Division 1.5	Maximum Allowable Quantity	
	Division 1.6	Maximum Allowable Quantity	
Oxidizers	Class 4	Maximum Allowable Quantity	Maximum Allowable Quantity
Unstable (reactives) detonable	Class 3 or 4	Maximum Allowable Quantity	Maximum Allowable Quantity
Oxidizer, liquids and solids	Class 3	1,200	Not Applicable
	Class 2	2,000	Not Applicable
Organic peroxides	Detonable	Maximum Allowable Quantity	Not Applicable
	Class I	Maximum Allowable Quantity	Not Applicable
	Class II	25	Not Applicable
	Class III	50	Not Applicable
Unstable (reactives) nondetonable	Class 3	1	2,000
	Class 2	25	10,000
Water reactives	Class 3	1	Not Applicable
	Class 2	25	Not Applicable
Pyrophoric gases	Not Applicable	Not Applicable	2,000

For SI: 1 ton = 906 kg, 1 cubic foot = 0.02832 m³, 1 pound = 0.454 kg.

- a. For materials that are detonable, the distance to other buildings or lot lines shall be as specified in Table 415.3.1 based on trinitrotoluene (TNT) equivalence of the material. For materials classified as explosives, see the *Florida Fire Prevention Code*. For all other materials, the distance shall be as indicated in Section 415.3.1.
- b. "Maximum Allowable Quantity" means the maximum allowable quantity per control area set forth in Table 307.7(1).
- c. Limited to Division 1.4 materials and articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco and Firearms (BATF) regulations or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles, providing the net explosive weight of individual articles does not exceed 1 pound.

[F] 415.6 Group H-2. Occupancies in Group H-2 shall be constructed in accordance with Sections 415.6.1 through 415.6.4 and the *Florida Fire Prevention Code*.

[F] 415.6.1 Combustible dusts, grain processing and storage. The provisions of Sections 415.6.1.1 through 415.6.1.6 shall apply to buildings in which materials that produce combustible dusts are stored or handled. Buildings that store or handle combustible dusts shall comply with the applicable provisions of NFPA 61, NFPA 120, NFPA 484, NFPA 654, NFPA 655, NFPA 664 and NFPA 85, and the *Florida Fire Prevention Code*.

[F] 415.6.1.1 Type of construction and height exceptions. Buildings shall be constructed in compliance with the height and area limitations of Table 503 for Group H-2; except that where erected of Type I or II construction, the heights and areas of grain elevators and similar structures shall be unlimited, and where of Type IV construction, the maximum height shall be 65 feet (19 812 mm) and except further that, in isolated areas, the maximum height of Type IV structures shall be increased to 85 feet (25 908 mm).

[F] 415.6.1.2 Grinding rooms. Every room or space occupied for grinding or other operations that produce

combustible dusts shall be enclosed with fire barriers that have not less than a 2-hour fire-resistance rating where the area is not more than 3,000 square feet (279 m²), and not less than a 4-hour fire-resistance rating where the area is greater than 3,000 square feet (279 m²).

[F] 415.6.1.3 Conveyors. Conveyors, chutes, piping and similar equipment passing through the enclosures of rooms or spaces shall be constructed dirt tight and vapor tight, and be of approved noncombustible materials complying with Chapter 30.

[F] 415.6.1.4 Explosion control. Explosion control shall be provided as specified in the *Florida Fire Prevention Code*, or spaces shall be equipped with the equivalent mechanical ventilation complying with the *Florida Building Code, Mechanical*.

[F] 415.6.1.5 Grain elevators. Grain elevators, malt houses and buildings for similar occupancies shall not be located within 30 feet (9144 mm) of interior lot lines or structures on the same lot, except where erected along a railroad right-of-way.

[F] 415.6.1.6 Coal pockets. Coal pockets located less than 30 feet (9144 mm) from interior lot lines or from structures on the same lot shall be constructed of not less

than Type IB construction. Where more than 30 feet (9144 mm) from interior lot lines, or where erected along a railroad right-of-way, the minimum type of construction of such structures not more than 65 feet (19 812 mm) in height shall be Type IV.

[F] 415.6.2 Flammable and combustible liquids. The storage, handling, processing and transporting of flammable and combustible liquids shall be in accordance with the *Florida Building Code, Mechanical* and the *Florida Fire Prevention Code*.

[F] 415.6.2.1 Mixed occupancies. Where the storage tank area is located in a building of two or more occupancies, and the quantity of liquid exceeds the maximum allowable quantity for one control area, the use shall be completely separated from adjacent fire areas in accordance with the requirements of Section 508.3.3.

[F] 415.6.2.1.1 Height exception. Where storage tanks are located within only a single-story building, the height limitation of Section 503 shall not apply for Group H.

[F] 415.6.2.2 Tank protection. Storage tanks shall be noncombustible and protected from physical damage. A fire barrier wall or horizontal assemblies or both around the storage tank(s) shall be permitted as the method of protection from physical damage.

[F] 415.6.2.3 Tanks. Storage tanks shall be approved tanks conforming to the requirements of the *Florida Fire Prevention Code*.

[F] 415.6.2.4 Suppression. Group H shall be equipped throughout with an approved automatic sprinkler system, installed in accordance with Section 903.

[F] 415.6.2.5 Leakage containment. A liquid-tight containment area compatible with the stored liquid shall be provided. The method of spill control, drainage control and secondary containment shall be in accordance with the *Florida Fire Prevention Code*.

Exception: Rooms where only double-wall storage tanks conforming to Section 415.6.2.3 are used to store Class I, II and IIIA flammable and combustible liquids shall not be required to have a leakage containment area.

[F] 415.6.2.6 Leakage alarm. An approved automatic alarm shall be provided to indicate a leak in a storage tank and room. The alarm shall sound an audible signal, 15 dBA above the ambient sound level, at every point of entry into the room in which the leaking storage tank is located. An approved sign shall be posted on every entry door to the tank storage room indicating the potential hazard of the interior room environment, or the sign shall state: WARNING, WHEN ALARM SOUNDS, THE ENVIRONMENT WITHIN THE ROOM MAY BE HAZARDOUS. The leakage alarm shall also be supervised in accordance with Chapter 9 to transmit a trouble signal.

[F] 415.6.2.7 Tank vent. Storage tank vents for Class I, II or IIIA liquids shall terminate to the outdoor air in accordance with the *Florida Fire Prevention Code*.

[F] 415.6.2.8 Room ventilation. Storage tank areas storing Class I, II or IIIA liquids shall be provided with mechanical ventilation. The mechanical ventilation system shall be in accordance with the *Florida Building Code, Mechanical* and the *Florida Fire Prevention Code*.

[F] 415.6.2.9 Explosion venting. Where Class I liquids are being stored, explosion venting shall be provided in accordance with the *Florida Fire Prevention Code*.

[F] 415.6.2.10 Tank openings other than vents. Tank openings other than vents from tanks inside buildings shall be designed to ensure that liquids or vapor concentrations are not released inside the building.

[F] 415.6.3 Liquefied petroleum gas-distribution facilities. The design and construction of propane, butane, propylene, butylene and other liquefied petroleum gas-distribution facilities shall conform to the applicable provisions of Sections 415.6.3.1 through 415.6.3.5.2. The storage and handling of liquefied petroleum gas systems shall conform to the *Florida Fire Prevention Code*. The design and installation of piping, equipment and systems that utilize liquefied petroleum gas shall be in accordance with the *Florida Building Code, Fuel Gas*. Liquefied petroleum gas-distribution facilities shall be ventilated in accordance with the *Florida Building Code, Mechanical* and Section 415.6.3.1.

[F] 415.6.3.1 Air movement. Liquefied petroleum gas-distribution facilities shall be provided with air inlets and outlets arranged so that air movement across the floor of the facility will be uniform. The total area of both inlet and outlet openings shall be at least 1 square inch (645 mm²) for each 1 square foot (0.093 m²) of floor area. The bottom of such openings shall not be more than 6 inches (152 mm) above the floor.

[F] 415.6.3.2 Construction. Liquefied petroleum gas-distribution facilities shall be constructed in accordance with Section 415.6.3.3 for separate buildings, Section 415.6.3.4 for attached buildings or Section 415.6.3.5 for rooms within buildings.

[F] 415.6.3.3 Separate buildings. Where located in separate buildings, liquefied petroleum gas-distribution facilities shall be occupied exclusively for that purpose or for other purposes having similar hazards. Such buildings shall be limited to one story in height and shall conform to Sections 415.6.3.3.1 through 415.6.3.3.3.

[F] 415.6.3.3.1 Floors. The floor shall not be located below ground level and any spaces beneath the floor shall be solidly filled or shall be unenclosed.

[F] 415.6.3.3.2 Materials. Walls, floors, ceilings, columns and roofs shall be constructed of noncombustible materials.

[F] **415.6.3.3.3 Explosion venting.** Explosion venting shall be provided in accordance with the *Florida Fire Prevention Code*.

[F] **415.6.3.4 Attached buildings.** Where liquefied petroleum gas-distribution facilities are located in an attached structure, the attached perimeter shall not exceed 50 percent of the perimeter of the space enclosed and the facility shall comply with Sections 415.6.3.3 and 415.6.3.4.1. Where the attached perimeter exceeds 50 percent, such facilities shall comply with Section 415.6.3.5.

[F] **415.6.3.4.1 Fire separation.** Separation of the attached structures shall be provided by fire barriers having a fire-resistance rating of not less than 1 hour and shall not have openings. Fire barriers between attached structures occupied only for the storage of LP-gas are permitted to have fire door assemblies that comply with Section 715. Such fire barriers shall be designed to withstand a static pressure of at least 100 pounds per square foot (psf) (4788 Pa), except where the building to which the structure is attached is occupied by operations or processes having a similar hazard.

[F] **415.6.3.5 Rooms within buildings.** Where liquefied petroleum gas-distribution facilities are located in rooms within buildings, such rooms shall be located in the first story above grade plane and shall have at least one exterior wall with sufficient exposed area to provide explosion venting as required in the *Florida Fire Prevention Code*. The building in which the room is located shall not have a basement or unventilated crawl space and the room shall comply with Sections 415.6.3.5.1 and 415.6.3.5.2.

[F] **415.6.3.5.1 Materials.** Walls, floors, ceilings and roofs of such rooms shall be constructed of approved noncombustible materials.

[F] **415.6.3.5.2 Common construction.** Walls and floor/ceiling assemblies common to the room and to the building where the room is located shall be fire barriers with not less than a 1-hour fire-resistance rating and without openings. Common walls for rooms occupied only for storage of LP-gas are permitted to have opening protectives complying with Section 715. The walls and ceilings shall be designed to withstand a static pressure of at least 100 psf (4788 Pa).

Exception: Where the building, within which the room is located, is occupied by operations or processes having a similar hazard.

[F] **415.6.4 Dry cleaning plants.** The construction and installation of dry cleaning plants shall be in accordance with the requirements of this code, the *Florida Building Code, Mechanical*, the *Florida Building Code, Plumbing* and NFPA 32. Dry cleaning solvents and systems shall be classified in accordance with the *Florida Fire Prevention Code*.

[F] **415.7 Groups H-3 and H-4.** Groups H-3 and H-4 shall be constructed in accordance with the applicable provisions of this code and the *Florida Fire Prevention Code*.

[F] **415.7.1 Gas rooms.** When gas rooms are provided, such rooms shall be separated from other areas by not less than a 1-hour fire barrier.

[F] **415.7.2 Floors in storage rooms.** Floors in storage areas for corrosive liquids and highly toxic or toxic materials shall be of liquid-tight, noncombustible construction.

[F] **415.7.3 Separation—highly toxic solids and liquids.** Highly toxic solids and liquids not stored in approved hazardous materials storage cabinets shall be isolated from other hazardous materials storage by a fire barrier having a fire-resistance rating of not less than 1 hour.

[F] **415.8 Group H-5.**

[F] **415.8.1 General.** In addition to the requirements set forth elsewhere in this code, Group H-5 shall comply with the provisions of Section 415.8 and the *Florida Fire Prevention Code*.

[F] **415.8.2 Fabrication areas.**

[F] **415.8.2.1 Hazardous materials in fabrication areas.**

[F] **415.8.2.1.1 Aggregate quantities.** The aggregate quantities of hazardous materials stored and used in a single fabrication area shall not exceed the quantities set forth in Table 415.8.2.1.1.

Exception: The quantity limitations for any hazard category in Table 415.8.2.1.1 shall not apply where the fabrication area contains quantities of hazardous materials not exceeding the maximum allowable quantities per control area established by Tables 307.1(1) and 307.1(2).

[F] **415.8.2.1.2 Hazardous production materials.** The maximum quantities of hazardous production materials (HPM) stored in a single fabrication area shall not exceed the maximum allowable quantities per control area established by Tables 307.1(1) and 307.1(2).

[F] **415.8.2.2 Separation.** Fabrication areas, whose sizes are limited by the quantity of hazardous materials allowed by Table 415.8.2.1.1, shall be separated from each other, from corridors and from other parts of the building by not less than 1-hour fire barriers.

Exceptions:

1. Doors within such fire barrier walls, including doors to corridors, shall be only self-closing fire door assemblies having a fire protection rating of not less than $\frac{3}{4}$ hour.
2. Windows between fabrication areas and corridors are permitted to be fixed glazing listed and labeled for a fire protection rating of at least $\frac{3}{4}$ hour in accordance with Section 715.

[F] TABLE 415.8.2.1.1
 QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5^a

HAZARD CATEGORY	SOLIDS (pounds per square feet)	LIQUIDS (gallons per square feet)	GAS (feet ³ @ NTP/square feet)
PHYSICAL-HAZARD MATERIALS			
Combustible dust	Note b	Not Applicable	Not Applicable
Combustible fiber Loose Baled	Note b Notes b, c	Not Applicable	Not Applicable
Combustible liquid II IIIA IIIB Combination Class I, II and IIIA	Not Applicable	0.01 0.02 Not Limited 0.04	Not Applicable
Cryogenic gas Flammable Oxidizing	Not Applicable	Not Applicable	Note d 1.25
Explosives	Note b	Note b	Note b
Flammable gas Gaseous Liquefied	Not Applicable	Not Applicable	Note d Note d
Flammable liquid IA IB IC Combination Class IA, IB and IC Combination Class I, II and IIIA	Not Applicable	0.0025 0.025 0.025 0.025 0.04	Not Applicable
Flammable solid	0.001	Not Applicable	Not Applicable
Organic peroxide Unclassified detonable Class I Class II Class III Class IV Class V	Note b Note b 0.025 0.1 Not Limited Not limited	Not Applicable	Not Applicable
Oxidizing gas Gaseous Liquefied	Not Applicable	Not Applicable	1.25 1.25
Combination of gaseous and liquefied			1.25
Oxidizer Class 4 Class 3 Class 2 Class 1 Combination Class 1, 2, 3	Note b 0.003 0.003 0.003 0.003	Note b 0.003 0.003 0.003 0.003	Not Applicable
Pyrophoric material	Note b	0.00125	Notes d and e
Unstable reactive Class 4 Class 3 Class 2 Class 1	Note b 0.025 0.1 Not Limited	Note b 0.0025 0.01 Not Limited	Note b Note b Note b Not Limited
Water reactive Class 3 Class 2 Class 1	Note b 0.25 Not Limited	0.00125 0.025 Not Limited	Not Applicable
HEALTH-HAZARD MATERIALS			
Corrosives	Not Limited	Not Limited	Not Limited
Highly toxic	Not Limited	Not Limited	Note d
Toxics	Not Limited	Not Limited	Note d

For SI: 1 pound per square foot = 4.882 kg/m², 1 gallon per square foot = 40.7 L/m², 1 cubic foot @ NTP/square foot = 0.305 m³ @ NTP/m², 1 cubic foot = 0.02832 M³.

- Hazardous materials within piping shall not be included in the calculated quantities.
- Quantity of hazardous materials in a single fabrication shall not exceed the maximum allowable quantities per control area in Tables 307.1(1) and 307.1(2).
- Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
- The aggregate quantity of flammable, pyrophoric, toxic and highly toxic gases shall not exceed 9,000 cubic feet at NTP.
- The aggregate quantity of pyrophoric gases in the building shall not exceed the amounts set forth in Table 415.3.2.

[F] 415.8.2.3 Location of occupied levels. Occupied levels of fabrication areas shall be located at or above the first story above grade plane.

[F] 415.8.2.4 Floors. Except for surfacing, floors within fabrication areas shall be of noncombustible construction.

Openings through floors of fabrication areas are permitted to be unprotected where the interconnected levels are used solely for mechanical equipment directly related to such fabrication areas (see also Section 415.8.2.5).

Floors forming a part of an occupancy separation shall be liquid tight.

[F] 415.8.2.5 Shafts and openings through floors. Elevator shafts, vent shafts and other openings through floors shall be enclosed when required by Section 707. Mechanical, duct and piping penetrations within a fabrication area shall not extend through more than two floors. The annular space around penetrations for cables, cable trays, tubing, piping, conduit or ducts shall be sealed at the floor level to restrict the movement of air. The fabrication area, including the areas through which the ductwork and piping extend, shall be considered a single conditioned environment.

[F] 415.8.2.6 Ventilation. Mechanical exhaust ventilation at the rate of not less than 1 cubic foot per minute per square foot [$0.0051 \text{ m}^3/(\text{s} \cdot \text{m}^2)$] of floor area shall be provided throughout the portions of the fabrication area where HPM are used or stored. The exhaust air duct system of one fabrication area shall not connect to another duct system outside that fabrication area within the building.

A ventilation system shall be provided to capture and exhaust gases, fumes and vapors at workstations.

Two or more operations at a workstation shall not be connected to the same exhaust system where either one or the combination of the substances removed could constitute a fire, explosion or hazardous chemical reaction within the exhaust duct system.

Exhaust ducts penetrating occupancy separations shall be contained in a shaft of equivalent fire-resistance-rated construction. Exhaust ducts shall not penetrate fire walls.

Fire dampers shall not be installed in exhaust ducts.

[F] 415.8.2.7 Transporting hazardous production materials to fabrication areas. HPM shall be transported to fabrication areas through enclosed piping or tubing systems that comply with Section 415.8.6.1, through service corridors complying with Section 415.8.4, or in corridors as permitted in the exception to Section 415.8.3. The handling or transporting of HPM within service corridors shall comply with the *Florida Fire Prevention Code*.

[F] 415.8.2.8 Electrical.

[F] 415.8.2.8.1 General. Electrical equipment and devices within the fabrication area shall comply with Chapter 27 of the *Florida Building Code, Building*.

The requirements for hazardous locations need not be applied where the average air change is at least four times that set forth in Section 415.8.2.6 and where the number of air changes at any location is not less than three times that required by Section 415.8.2.6. The use of recirculated air shall be permitted.

[F] 415.8.2.8.2 Workstations. Workstations shall not be energized without adequate exhaust ventilation. See Section 415.8.2.6 for workstation exhaust ventilation requirements.

[F] 415.8.3 Corridors. Corridors shall comply with Chapter 10 and shall be separated from fabrication areas as specified in Section 415.8.2.2. Corridors shall not contain HPM and shall not be used for transporting such materials, except through closed piping systems as provided in Section 415.8.6.3.

Exception: Where existing fabrication areas are altered or modified, HPM is allowed to be transported in existing corridors, subject to the following conditions:

1. Corridors. Corridors adjacent to the fabrication area where the alteration work is to be done shall comply with Section 1017 for a length determined as follows:
 - 1.1 The length of the common wall of the corridor and the fabrication area; and
 - 1.2 For the distance along the corridor to the point of entry of HPM into the corridor serving that fabrication area.
2. Emergency alarm system. There shall be an emergency telephone system, a local manual alarm station or other approved alarm-initiating device within corridors at not more than 150-foot (45 720 mm) intervals and at each exit and doorway. The signal shall be relayed to an approved central, proprietary or remote station service or the emergency control station and shall also initiate a local audible alarm.
3. Pass-throughs. Self-closing doors having a fire protection rating of not less than 1 hour shall separate pass-throughs from existing corridors. Pass-throughs shall be constructed as required for the corridors and protected by an approved automatic fire-extinguishing system.

[F] 415.8.4 Service corridors.

[F] 415.8.4.1 Occupancy. Service corridors shall be classified as Group H-5.

[F] 415.8.4.2 Use conditions. Service corridors shall be separated from corridors as required by Section 415.8.2.2. Service corridors shall not be used as a required corridor.

[F] 415.8.4.3 Mechanical ventilation. Service corridors shall be mechanically ventilated as required by Section 415.8.2.6 or at not less than six air changes per hour, whichever is greater.

[F] 415.8.4.4 Means of egress. The maximum distance of travel from any point in a service corridor to an exit, exit access corridor or door into a fabrication area shall not exceed 75 feet (22 860 mm). Dead ends shall not exceed 4 feet (1219 mm) in length. There shall be not less than two exits, and not more than one-half of the required means of egress shall require travel into a fabrication area. Doors from service corridors shall swing in the direction of egress travel and shall be self-closing.

[F] 415.8.4.5 Minimum width. The minimum clear width of a service corridor shall be 5 feet (1524 mm), or 33 inches (838 mm) wider than the widest cart or truck used in the corridor, whichever is greater.

[F] 415.8.4.6 Emergency alarm system. Emergency alarm systems shall be provided in accordance with this section and Sections 414.7.1 and 414.7.2. The maximum allowable quantity per control area provisions shall not apply to emergency alarm systems required for HPM.

[F] 415.8.4.6.1 Service corridors. An emergency alarm system shall be provided in service corridors, with at least one alarm device in each service corridor.

[F] 415.8.4.6.2 Exit access corridors and exit enclosures. Emergency alarms for exit access corridors and exit enclosures shall comply with Section 414.7.2.

[F] 415.8.4.6.3 Liquid storage rooms, HPM rooms and gas rooms. Emergency alarms for liquid storage rooms, HPM rooms and gas rooms shall comply with Section 414.7.1.

[F] 415.8.4.6.4 Alarm-initiating devices. An approved emergency telephone system, local alarm manual pull stations, or other approved alarm-initiating devices are allowed to be used as emergency alarm-initiating devices.

[F] 415.8.4.6.5 Alarm signals. Activation of the emergency alarm system shall sound a local alarm and transmit a signal to the emergency control station.

[F] 415.8.5 Storage of hazardous production materials.

[F] 415.8.5.1 General. Storage of HPM in fabrication areas shall be within approved or listed storage cabinets or gas cabinets or within a workstation. The storage of HPM in quantities greater than those listed in the *Florida Fire Prevention Code* shall be in liquid storage rooms, HPM rooms or gas rooms as appropriate for the materials stored. The storage of other hazardous materials shall be in accordance with other applicable provisions of this code and the *Florida Fire Prevention Code*.

[F] 415.8.5.2 Construction.

[F] 415.8.5.2.1 HPM rooms and gas rooms. HPM rooms and gas rooms shall be separated from other areas by not less than a 2-hour fire barrier where the area is 300 square feet (27.9 m²) or more and not less than a 1-hour fire barrier where the area is less than 300 square feet (27.9 m²).

[F] 415.8.5.2.2 Liquid storage rooms. Liquid storage rooms shall be constructed in accordance with the following requirements:

1. Rooms in excess of 500 square feet (46.5 m²) shall have at least one exterior door approved for fire department access.
2. Rooms shall be separated from other areas by fire barriers having a fire-resistance rating of not less than 1-hour for rooms up to 150 square feet (13.9 m²) in area and not less than 2 hours where the room is more than 150 square feet (13.9 m²) in area.
3. Shelving, racks and wainscoting in such areas shall be of noncombustible construction or wood of not less than 1 inch (25 mm) nominal thickness.
4. Rooms used for the storage of Class I flammable liquids shall not be located in a basement.

[F] 415.8.5.2.3 Floors. Except for surfacing, floors of HPM rooms and liquid storage rooms shall be of noncombustible liquid-tight construction. Raised grating over floors shall be of noncombustible materials.

[F] 415.8.5.3 Location. Where HPM rooms, liquid storage rooms and gas rooms are provided, they shall have at least one exterior wall and such wall shall be not less than 30 feet (9144 mm) from lot lines, including lot lines adjacent to public ways.

[F] 415.8.5.4 Explosion control. Explosion control shall be provided where required by Section 414.5.1.

[F] 415.8.5.5 Exits. Where two exits are required from HPM rooms, liquid storage rooms and gas rooms, one shall be directly to the outside of the building.

[F] 415.8.5.6 Doors. Doors in a fire barrier wall, including doors to corridors, shall be self-closing fire door assemblies having a fire-protection rating of not less than ³/₄ hour.

[F] 415.8.5.7 Ventilation. Mechanical exhaust ventilation shall be provided in liquid storage rooms, HPM rooms and gas rooms at the rate of not less than 1 cubic foot per minute per square foot (0.044 L/s/m²) of floor area or six air changes per hour, whichever is greater, for categories of material.

Exhaust ventilation for gas rooms shall be designed to operate at a negative pressure in relation to the surrounding areas and direct the exhaust ventilation to an exhaust system.

[F] 415.8.5.8 Emergency alarm system. An approved emergency alarm system shall be provided for HPM rooms, liquid storage rooms and gas rooms.

Emergency alarm-initiating devices shall be installed outside of each interior exit door of such rooms.

Activation of an emergency alarm-initiating device shall sound a local alarm and transmit a signal to the emergency control station.

An approved emergency telephone system, local alarm manual pull stations or other approved alarm-initiating devices are allowed to be used as emergency alarm-initiating devices.

[F] 415.8.6 Piping and tubing.

[F] 415.8.6.1 General. Hazardous production materials piping and tubing shall comply with this section and ASME B31.3.

[F] 415.8.6.2 Supply piping and tubing.

[F] 415.8.6.2.1 HPM having a health-hazard ranking of 3 or 4. Systems supplying HPM liquids or gases having a health-hazard ranking of 3 or 4 shall be welded throughout, except for connections, to the systems that are within a ventilated enclosure if the material is a gas, or an approved method of drainage or containment is provided for the connections if the material is a liquid.

[F] 415.8.6.2.2 Location in service corridors. Hazardous production materials supply piping or tubing in service corridors shall be exposed to view.

[F] 415.8.6.2.3 Excess flow control. Where HPM gases or liquids are carried in pressurized piping above 15 pounds per square inch gauge (psig) (103.4 kPa), excess flow control shall be provided. Where the piping originates from within a liquid storage room, HPM room or gas room, the excess flow control shall be located within the liquid storage room, HPM room or gas room. Where the piping originates from a bulk source, the excess flow control shall be located as close to the bulk source as practical.

[F] 415.8.6.3 Installations in corridors and above other occupancies. The installation of HPM piping and tubing within the space defined by the walls of corridors and the floor or roof above, or in concealed spaces above other occupancies, shall be in accordance with Section 415.8.6.2 and the following conditions:

1. Automatic sprinklers shall be installed within the space unless the space is less than 6 inches (152 mm) in the least dimension.
2. Ventilation not less than six air changes per hour shall be provided. The space shall not be used to convey air from any other area.
3. Where the piping or tubing is used to transport HPM liquids, a receptor shall be installed below such piping or tubing. The receptor shall be designed to collect any discharge or leakage and drain it to an approved location. The 1-hour enclosure shall not be used as part of the receptor.
4. HPM supply piping and tubing and nonmetallic waste lines shall be separated from the corridor and from occupancies other than Group H-5 by fire barriers that have a fire-resistance rating of not less than 1 hour. Where gypsum wallboard is used, joints on the piping side of the enclosure are not required to be taped, provided the joints occur over framing members. Access openings into the enclosure

shall be protected by approved fire protection-rated assemblies.

5. Readily accessible manual or automatic remotely activated fail-safe emergency shutoff valves shall be installed on piping and tubing other than waste lines at the following locations:

- 5.1. At branch connections into the fabrication area.
- 5.2. At entries into corridors.

Exception: Transverse crossings of the corridors by supply piping that is enclosed within a ferrous pipe or tube for the width of the corridor need not comply with Items 1 through 5.

[F] 415.8.6.4 Identification. Piping, tubing and HPM waste lines shall be identified in accordance with ANSI A13.1 to indicate the material being transported.

[F] 415.8.7 Continuous gas detection systems. A continuous gas detection system shall be provided for HPM gases when the physiological warning threshold level of the gas is at a higher level than the accepted PEL for the gas and for flammable gases in accordance with this section.

[F] 415.8.7.1 Where required. A continuous gas-detection system shall be provided in the areas identified in Sections 415.8.7.1.1 through 415.8.7.1.4.

[F] 415.8.7.1.1 Fabrication areas. A continuous gas-detection system shall be provided in fabrication areas when gas is used in the fabrication area.

[F] 415.8.7.1.2 HPM rooms. A continuous gas-detection system shall be provided in HPM rooms when gas is used in the room.

[F] 415.8.7.1.3 Gas cabinets, exhausted enclosures and gas rooms. A continuous gas-detection system shall be provided in gas cabinets and exhausted enclosures. A continuous gas-detection system shall be provided in gas rooms when gases are not located in gas cabinets or exhausted enclosures.

[F] 415.8.7.1.4 Corridors. When gases are transported in piping placed within the space defined by the walls of a corridor and the floor or roof above the corridor, a continuous gas-detection system shall be provided where piping is located and in the corridor.

Exception: A continuous gas-detection system is not required for occasional transverse crossings of the corridors by supply piping that is enclosed in a ferrous pipe or tube for the width of the corridor.

[F] 415.8.7.2 Gas-detection system operation. The continuous gas-detection system shall be capable of monitoring the room, area or equipment in which the gas is located at or below the PEL or ceiling limit of the gas for which detection is provided. For flammable gases, the monitoring detection threshold level shall be vapor concentrations in excess of 20 percent of the lower explosive limit (LEL). Monitoring for highly toxic and

toxic gases shall also comply with the requirements for such material in the *Florida Fire Prevention Code*.

[F] 415.8.7.2.1 Alarms. The gas detection system shall initiate a local alarm and transmit a signal to the emergency control station when a short-term hazard condition is detected. The alarm shall be both visual and audible and shall provide warning both inside and outside the area where the gas is detected. The audible alarm shall be distinct from all other alarms.

[F] 415.8.7.2.2 Shutoff of gas supply. The gas detection system shall automatically close the shutoff valve at the source on gas supply piping and tubing related to the system being monitored for which gas is detected when a short-term hazard condition is detected. Automatic closure of shutoff valves shall comply with the following:

1. Where the gas-detection sampling point initiating the gas detection system alarm is within a gas cabinet or exhausted enclosure, the shutoff valve in the gas cabinet or exhausted enclosure for the specific gas detected shall automatically close.
2. Where the gas-detection sampling point initiating the gas detection system alarm is within a room and compressed gas containers are not in gas cabinets or an exhausted enclosure, the shutoff valves on all gas lines for the specific gas detected shall automatically close.
3. Where the gas-detection sampling point initiating the gas detection system alarm is within a piping distribution manifold enclosure, the shutoff valve supplying the manifold for the compressed gas container of the specific gas detected shall automatically close.

Exception: Where the gas-detection sampling point initiating the gas detection system alarm is at the use location or within a gas valve enclosure of a branch line downstream of a piping distribution manifold, the shutoff valve for the branch line located in the piping distribution manifold enclosure shall automatically close.

[F] 415.8.8 Manual fire alarm system. An approved manual fire alarm system shall be provided throughout buildings containing Group H-5. Activation of the alarm system shall initiate a local alarm and transmit a signal to the emergency control station. The fire alarm system shall be designed and installed in accordance with Section 907.

415.8.9 Emergency control station. An emergency control station shall be provided in accordance with Sections 415.8.9.1 through 415.8.9.3.

415.8.9.1 Location. The emergency control station shall be located on the premises at an approved location outside the fabrication area.

415.8.9.2 Staffing. Trained personnel shall continuously staff the emergency control station.

415.8.9.3 Signals. The emergency control station shall receive signals from emergency equipment and alarm and detection systems. Such emergency equipment and alarm and detection systems shall include, but not be limited to, the following where such equipment or systems are required to be provided either in this chapter or elsewhere in this code:

1. Automatic fire sprinkler system alarm and monitoring systems.
2. Manual fire alarm systems.
3. Emergency alarm systems.
4. Continuous gas-detection systems.
5. Smoke detection systems.
6. Emergency power system.
7. Automatic detection and alarm systems for pyrophoric liquids and Class 3 water-reactive liquids required in the *Florida Fire Prevention Code*.
8. Exhaust ventilation flow alarm devices for pyrophoric liquids and Class 3 water-reactive liquids cabinet exhaust ventilation systems required in the *Florida Fire Prevention Code*.

[F] 415.8.10 Emergency power system. An emergency power system shall be provided in Group H-5 occupancies where required in Section 415.8.10.1. The emergency power system shall be designed to supply power automatically to required electrical systems when the normal electrical supply system is interrupted.

[F] 415.8.10.1 Required electrical systems. Emergency power shall be provided for electrically operated equipment and connected control circuits for the following systems:

1. HPM exhaust ventilation systems.
2. HPM gas cabinet ventilation systems.
3. HPM exhausted enclosure ventilation systems.
4. HPM gas room ventilation systems.
5. HPM gas detection systems.
6. Emergency alarm systems.
7. Manual fire alarm systems.
8. Automatic sprinkler system monitoring and alarm systems.
9. Automatic alarm and detection systems for pyrophoric liquids and Class 3 water-reactive liquids required in the *Florida Fire Prevention Code*.
10. Flow alarm switches for pyrophoric liquids and Class 3 water-reactive liquids cabinet exhaust ventilation systems required in the *Florida Fire Prevention Code*.
11. Electrically operated systems required elsewhere in this code or in the *Florida Fire Prevention Code* applicable to the use, storage or handling of HPM.

[F] **415.8.10.2 Exhaust ventilation systems.** Exhaust ventilation systems are allowed to be designed to operate at not less than one-half the normal fan speed on the emergency power system where it is demonstrated that the level of exhaust will maintain a safe atmosphere.

[F] **415.8.11 Automatic sprinkler system protection in exhaust ducts for HPM.**

[F] **415.8.11.1 Exhaust ducts for HPM.** An approved automatic sprinkler system shall be provided in exhaust ducts conveying gases, vapors, fumes, mists or dusts generated from HPM in accordance with this section and the *Florida Building Code, Mechanical*.

[F] **415.8.11.2 Metallic and noncombustible nonmetallic exhaust ducts.** An approved automatic sprinkler system shall be provided in metallic and noncombustible nonmetallic exhaust ducts when all of the following conditions apply:

1. Where the largest cross-sectional diameter is equal to or greater than 10 inches (254 mm).
2. The ducts are within the building.
3. The ducts are conveying flammable gases, vapors or fumes.

[F] **415.8.11.3 Combustible nonmetallic exhaust ducts.** Automatic sprinkler system protection shall be provided in combustible nonmetallic exhaust ducts where the largest cross-sectional diameter of the duct is equal to or greater than 10 inches (254 mm).

Exceptions:

1. Ducts listed or approved for applications without automatic fire sprinkler system protection.
2. Ducts not more than 12 feet (3658 mm) in length installed below ceiling level.

[F] **415.8.11.4 Automatic sprinkler locations.** Sprinkler systems shall be installed at 12-foot (3658 mm) intervals in horizontal ducts and at changes in direction. In vertical ducts, sprinklers shall be installed at the top and at alternate floor levels.

SECTION 416

APPLICATION OF FLAMMABLE FINISHES

[F] **416.1 General.** The provisions of this section shall apply to the construction, installation and use of buildings and structures, or parts thereof, for the spraying of flammable paints, varnishes and lacquers or other flammable materials or mixtures or compounds used for painting, varnishing, staining or similar purposes. Such construction and equipment shall comply with the *Florida Fire Prevention Code*.

[F] **416.2 Spray rooms.** Spray rooms shall be enclosed with fire barriers with not less than a 1-hour fire-resistance rating. Floors shall be waterproofed and drained in an approved manner.

[F] **416.2.1 Surfaces.** The interior surfaces of spray rooms shall be smooth and shall be so constructed to permit the free passage of exhaust air from all parts of the interior and to

facilitate washing and cleaning, and shall be so designed to confine residues within the room. Aluminum shall not be used.

[F] **416.3 Spraying spaces.** Spraying spaces shall be ventilated with an exhaust system to prevent the accumulation of flammable mist or vapors in accordance with the *Florida Building Code, Mechanical*. Where such spaces are not separately enclosed, noncombustible spray curtains shall be provided to restrict the spread of flammable vapors.

[F] **416.3.1 Surfaces.** The interior surfaces of spraying spaces shall be smooth and continuous without edges; shall be so constructed to permit the free passage of exhaust air from all parts of the interior and to facilitate washing and cleaning; and shall be so designed to confine residues within the spraying space. Aluminum shall not be used.

[F] **416.4 Fire protection.** An automatic fire-extinguishing system shall be provided in all spray, dip and immersing spaces and storage rooms and shall be installed in accordance with Chapter 9.

SECTION 417

DRYING ROOMS

[F] **417.1 General.** A drying room or dry kiln installed within a building shall be constructed entirely of approved noncombustible materials or assemblies of such materials regulated by the approved rules or as required in the general and specific sections of Chapter 4 for special occupancies and where applicable to the general requirements of Chapter 28.

[F] **417.2 Piping clearance.** Overhead heating pipes shall have a clearance of not less than 2 inches (51 mm) from combustible contents in the dryer.

[F] **417.3 Insulation.** Where the operating temperature of the dryer is 175°F (79°C) or more, metal enclosures shall be insulated from adjacent combustible materials by not less than 12 inches (305 mm) of airspace, or the metal walls shall be lined with 1/4-inch (6.35 mm) insulating mill board or other approved equivalent insulation.

[F] **417.4 Fire protection.** Drying rooms designed for high-hazard materials and processes, including special occupancies as provided for in Chapter 4, shall be protected by an approved automatic fire-extinguishing system complying with the provisions of Chapter 9.

SECTION 418

ORGANIC COATINGS

[F] **418.1 Building features.** Manufacturing of organic coatings shall be done only in buildings that do not have pits or basements.

[F] **418.2 Location.** Organic coating manufacturing operations and operations incidental to or connected therewith shall not be located in buildings having other occupancies.

[F] **418.3 Process mills.** Mills operating with close clearances and that process flammable and heat-sensitive materials, such as nitrocellulose, shall be located in a detached building or noncombustible structure.

[F] 418.4 Tank storage. Storage areas for flammable and combustible liquid tanks inside of structures shall be located at or above grade and shall be separated from the processing area by not less than 2-hour fire barriers.

[F] 418.5 Nitrocellulose storage. Nitrocellulose storage shall be located on a detached pad or in a separate structure or a room enclosed with no less than 2-hour fire barriers.

[F] 418.6 Finished products. Storage rooms for finished products that are flammable or combustible liquids shall be separated from the processing area by fire barriers having a fire-resistance rating of at least 2 hours, and openings in the walls shall be protected with approved opening protectives.

SECTION 419 HOSPITALS

419.1 Scope.

419.1.1 Hospitals shall comply with all applicable requirements of the code and the following design and construction standards as described herein and shall have plans reviewed and construction surveyed by the state agency authorized to do so by Chapter 553.80(1)(c), *Florida Statutes*.

Note: For project submission and fee requirements, codes and standards for existing facilities, and other administrative, licensure and programmatic provisions for hospitals, see Agency for Health Care Administration [AHCA] Chapter 59A-3, *Florida Administrative Code* and Chapter 395, *Florida Statutes*.

419.2 Codes and standards for the design and construction of general, rehabilitative, and psychiatric hospitals, including Intensive Residential Treatment Facilities (IRTF) for children and adolescents.

419.2.1 Except as modified and required by this section of the code, *Chapter 59A-3 Florida Administrative Code*, or by Chapter 395, *Florida Statutes*, all new hospitals, as listed in Section 419.2 of the code, all outpatient facilities of hospitals, and all projects, as described in Section 105 of the code, to these existing hospitals, shall also be in compliance with the following codes and standards on the effective date of the code:

419.2.1.1 The fire codes described in Chapter 69A-53, *Uniform Fire Safety Standards for Hospitals and Nursing Homes, Florida Administrative Code*.

419.2.1.2 **The Guidelines for Design and Construction of Health Care Facilities** (The Guidelines), Part I - General, Part 2 - Hospitals, and Part 3 - Ambulatory Care Facilities, incorporated by reference and obtainable from the American Institute of Architects, 1735 New York Ave., N.W., Washington, D.C. 20006-5292.

419.2.1.3 *Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems, Sheet Metal and Air Conditioning Contractors National Association, Inc.* (SMACNA).

419.3 Additional physical plant requirements for general, rehabilitation, and psychiatric hospitals, including Intensive Residential Treatment Facilities (IRTF) for children and adolescents.

419.3.1 In addition to the codes and standards referenced in Section 419.2 of the code, the following minimum standards of construction and specified minimum essential facilities, shall apply to all new hospitals, as listed in Section 419.3 of the code, all additions, alterations or renovations to these existing hospitals and to outpatient facilities owned or operated by these hospitals as described in Chapter 395.0163, *Florida Statutes*, on the effective date of the code.

419.3.2 Critical care units. (Reference The Guidelines for other requirements.)

419.3.2.1 Toileting facilities are required for each critical care patient. When portable or under cabinet modular toilets are utilized in lieu of individual toilet rooms, provisions shall be made for user privacy, and the storage, servicing and odor control of these toilet units. Permanently installed toilet fixtures located inside of the critical care room shall not be permitted.

419.3.2.2 Sliding doors used for access to critical care rooms may be either manual or power operated and shall be smoke resistive if located on an exit access corridor.

419.3.3 Newborn intensive care units. Reference The Guidelines for other requirements.)

419.3.3.1 General categories of neonatal services in the State of Florida are Level I, newborn nursery; Level II, intermediate care unit; and Level III, intensive care unit. Facilities which offer obstetrical services shall provide at a minimum a Level I newborn nursery or a holding nursery that shall meet the requirements of The Guidelines, and facilities that offer neonatal care for Level II and Level III neonatal services shall meet the requirements of The Guidelines for a newborn intensive care unit.

419.3.3.2 In facilities that provide labor/delivery/recovery (LDR) rooms with postpartum bedrooms with rooming-in capabilities or labor/delivery/recovery/postpartum (LDRP) rooms, a full-term or Level I nursery is not required. In that case, a baby holding nursery shall be provided and shall meet the requirements of The Guidelines.

419.3.4 Mobile testing and treatment facilities.

419.3.4.1 In addition to any other state of Florida required permits, mobile facilities shall be approved in advance by the Agency for Health Care Administration before they may be utilized for patient services.

419.3.4.2 When the mobile facility is located in a roadway or a parking lot, there shall be sturdy walls, fences or bollards around the immediate site to prevent collisions with the unit by other vehicles

419.3.4.3 Electrical connection to the hospital electrical system shall be permitted only when the mobile facility complies with appropriate requirements of the *Florida Building Code, Building*.

419.3.4.4 There shall be a rain-free passage from the hospital to the entrance to the mobile facility.

419.3.4.5 A fire alarm system shall be provided. An alarm initiated in the mobile facility shall activate the hospital sys-

tem at the 24-hour staffed location, and a fire alarm signal in the hospital shall sound an alarm in the mobile facility.

419.3.4.6 The mobile facility shall not diminish egress from the hospital.

419.3.4.7 There shall be a telephone located inside the mobile facility connected to the hospital communication system.

419.3.4.8 When units provide critical care procedures, there shall be a code blue station in the unit connected to the hospital response team.

419.3.4.9 The electrical systems in the mobile facility shall comply with the requirements of the *Florida Building Code, Building*, The Guidelines and with Section 419.3.15 of the code for the type of service to be provided.

419.3.4.10 The mechanical systems in the mobile facility shall comply with the requirements of the *Florida Building Code, Mechanical*, The Guidelines and with Section 419.3.11 of the code.

419.3.5 Outpatient surgery. Reserved.

419.3.6 Obstetrical facilities. Reserved.

419.3.7 Administration and public areas. Reserved.

419.3.8 Mobile testing and treatment facilities. Reserved.

419.3.9 Details and finishes. (See The Guidelines for other requirements.)

419.3.9.1 Each patient sleeping room shall be provided with a window that shall have a minimum 20-foot (6 m) unobstructed vista measured perpendicularly from the plane of the window.

419.3.9.2 Ceilings in rooms with ceiling-mounted surgical light fixtures and in kitchens shall be a minimum height of 9 feet (2.7 m).

419.3.9.3 Soap dispensers shall be provided at all hand washing facilities. If soap dishes are used, only fully recessed soap dishes shall be permitted in patient tubs or showers.

419.3.9.4 Toilet compartment partitions and urinal screens in the men's toilet rooms shall not be constructed of enameled steel.

419.3.9.5 All smoke partitions, horizontal exits and exit passageway partitions shall be constructed prior to the construction of intervening walls.

419.3.9.6 Smoke partitions shall be constructed so as to provide a continuous smoke-tight membrane from exterior wall to exterior wall and from the floor to the underside of the deck above. This includes interstitial space and the area above solid fire tested membranes.

419.3.9.7 Where it is not possible to inspect fire/smoke partitions because of the fire-tested membrane, fire-rated access panels shall be installed adjacent to each side of the smoke partitions at intervals not exceeding 30 feet (9 m) and in such locations as necessary to view all surfaces of the partition. Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall

required to have protected openings shall be effectively and permanently identified with signs or stenciling. Such identification shall be above any decorative ceiling and in concealed spaces. Suggested wording for a fire/smoke partition is as follows: "FIRE AND SMOKE BARRIER – PROTECT ALL OPENINGS."

419.3.9.8 Where electrical conduits, cable trays, ducts and utility pipes pass through the smoke partition, the utilities shall be located so that access is maintained to adjacent wall surfaces and to all damper access panels. The details shall show the studs and reinforcing half studs so that proper support is provided for the wall surfacing material. There shall be a minimum clearance of 6 inches (152 mm) between all conduits, piping and duct work that are parallel or adjacent to all fire and fire/smoke rated walls to facilitate the inspection of these walls.

419.3.9.9 The use of sliding or folding doors to patient use toilet, baths, or showers shall not be permitted.

419.3.10 Elevators where required. (See The Guidelines for other requirements.) All elevators shall be in compliance with the requirements of Chapter 30 of the *Florida Building Code, Building* and Chapter 69A-47, *Florida Administrative Code*, "Uniform Fire Safety Standards for Elevators."

419.3.11 Heating, ventilating and air-conditioning systems. (See Section 7.31 of The Guidelines for other requirements.)

419.3.11.1 Air-handling equipment shall be located in mechanical equipment rooms unless it serves only one room and it is located in that room.

419.3.11.2 Ventilation shall be provided by mechanical means in all rooms in new facilities and in all remodeled rooms.

419.3.11.3 Rooms requiring positive or negative relative pressures, shall maintain the air quantities as required between the supply, return or exhaust at a minimum of 75 cfm (2.13 m³/min.) for room areas 100 square feet (929 m²) or larger and 50 cfm (1.42 m³/min) for rooms less than 100 square feet (929 m²).

419.3.11.4 All new hospital, outpatient surgery and cardiac catheterization facility construction shall have completely ducted air supply, return, outside air and exhaust systems. In buildings with multiple uses, tenants or occupancies, the licensed health care areas shall be served by separate ducted mechanical air supply, return and exhaust systems.

419.3.11.5 In new construction, horizontal offsets of duct system risers penetrating more than one floor shall not be allowed.

419.3.11.6 Flexible duct work shall have a continuous metal inner liner encased by insulating material with an outer vapor jacket conforming to UL 181 unless the flexible duct meets the following criteria:

- The duct conforms to UL Class 1 Air Duct, Standard 181 with minimum rated air velocity of 4,000 feet per minute, and is pressure rated for a minimum of 4-inches water gage positive pressure and 1-inch water gage negative pressure.

- The inner core of the duct is constructed of Chlorinated Polyethylene (CPE) material encircling a steel helix bonded to the CPE.
- The duct has a fire-retardant metalized vapor barrier that is reinforced with crosshatched fiberglass scrim having a permanence of not greater than 0.05 perms when tested in accordance with ASTM E 96 Procedure A.
- The duct has passed an impact test equal to the UL 181 standard, conducted by a nationally recognized testing laboratory (NRTL) except it shall use a 25-pound weight dropped from a height of 10 feet. As a result of the test, the inner and outer surfaces of the sample shall not have ruptured, broken, torn, ripped, collapsed or separated in order for the duct to pass the test. In addition, the helix shall rebound to a cross-sectional elliptical area not less than 80 percent of the original test sample diameter.

The use of flexible duct shall be limited to flexible air connector applications.

419.3.11.7 Variable air volume systems shall not be permitted for use in surgical departments, obstetrical departments, laboratories, isolation rooms and critical care units and rooms.

419.3.11.8 Filter housing frame blank-off panels shall be permanently attached to the frame, constructed of rigid materials and have sealing surfaces equal to or greater than the filter media installed in the filter frame.

419.3.11.9 Each air handling unit filter rated in excess of 1,000 cfm (28.32 m³/min) capacity shall be equipped with a differential pressure gauge. The range of acceptable operation shall be clearly and permanently indicated on the gauge face or display. Multiple bank filter assemblies shall be equipped with a gauge for each filter media bank.

419.3.12 Fan and damper control during fire alarm.

419.3.12.1 During a fire alarm, fan systems and fan equipment serving more than one room shall be stopped to prevent the movement of smoke by mechanical means from the zone in alarm to adjacent smoke zones.

419.3.12.2 Fan control shall be designed so as to minimize the interruption of heating, ventilating and air conditioning in compartments remote from the compartment in alarm.

419.3.12.3 Fan control shall not interfere with the continuous operation of exhaust systems conveying ethylene oxide or other hazardous chemicals and fumes or systems required to operate continuously for the health and safety of occupants. Such systems shall include fume hood exhaust deemed by the governing body of the hospital to present a hazard to occupants if exhaust airflow is stopped. Air-handling systems shall be designed to allow for continuous operation of all such systems and to minimize movement of smoke by mechanical means from the zone in alarm.

419.3.13 Plumbing. (See Section 7.31.E of The Guidelines for other requirements.)

419.3.13.1 All plumbing systems shall be designed and installed in accordance with the *Florida Building Code, Plumbing*.

419.3.13.2 Grease interceptors shall be located outside of the building.

419.3.13.3 Wall-mounted lavatories and hand-washing facilities shall be attached to floor-mounted carriers and shall withstand an applied vertical load of a minimum of 250 pounds (114 kg) on the front of the fixture.

419.3.14 Fire pump. Where required in new construction, fire pumps and ancillary equipment shall be separated from other functions by construction having a 2-hour fire-resistance rating.

419.3.14.1 The fire pump normal service disconnect shall be rated to hold locked rotor current indefinitely. If the approved normal service disconnect is located on the exterior, it shall be supervised by connection to the fire pump remote annunciator and shall provide a separate fire alarm system trouble indication.

419.3.14.2 When the fire pump is placed on the emergency system in addition to the normal supply, the emergency feeder protective device shall be sized in accordance with maximum rating or settings of Chapter 27 of the *Florida Building Code, Building*.

419.3.14.3 The fire pump transfer switch may be either manual or automatic. If located on the line side of the controller as a separate unit, the switch must be rated for the pump motor locked rotor current indefinitely and must be located in the pump room.

419.3.14.4 Combination fire pump controller and transfer switch units listed by the Underwriter's Laboratories, Inc., as prescribed by Chapter 27 of the *Florida Building Code, Building* are acceptable when the transfer switch has exposable and replaceable contacts, not circuit breaker types, rated for the available short-circuit current.

419.3.14.5 The fire pump shall be installed in a readily accessible location. When it is located on the grade level floor, there shall be direct access from the exterior.

419.3.15 Electrical requirements. (See The Guidelines for other requirements.) All material, including equipment, conductors, controls, and signaling devices, shall be installed to provide a complete electrical system with the necessary characteristics and capacity to supply the electrical facility requirements as shown in the specifications and as indicated on the plans. All materials and equipment shall be factory listed as complying with applicable standards of Underwriter's Laboratories, Inc. or other similarly established standards of a nationally recognized testing laboratory (NRTL) that has been certified by the Occupational Safety and Health Administration (OSHA) for that referenced standard.

419.3.15.1 Nonmetallic sheathed cable or similar systems are not permitted for power and lighting wiring in any facility.

419.3.15.2 Panel boards located in spaces subject to storage shall have the clear working space per Chapter 27, *Florida Building Code, Building*. “ELECTRICAL ACCESS - NOT FOR STORAGE” shall be permanently marked on the floor and wall about the panel. Panel boards shall not be located in egress corridors.

419.3.15.3 There shall be documentation for equipotential grounding in all patient care areas, building service ground electrode systems, lightning protection ground terminals and special systems such as fire alarm, nurse call, paging, generator, emergency power, fault analysis and breaker coordination.

419.3.15.4 All spaces occupied by people, machinery and equipment within buildings and approaches to buildings shall have electric lighting.

419.3.15.5 Operating rooms and delivery rooms shall have general lighting for the room in addition to local high intensity, specialized lighting provided by special fixtures at the surgical and obstetrical tables. Each special lighting unit for local lighting at the tables shall be connected to an independent circuit and shall be powered from the critical branch. A minimum of one general purpose lighting fixture shall be powered from a normal circuit in an operating room, delivery or similar room.

419.3.15.6 There shall be a maximum of six duplex receptacles on a circuit in general patient care areas.

419.3.15.7 Duplex receptacles in critical care areas, in all emergency treatment rooms or areas, and other areas including, angiographic laboratories, cardiac catheterization laboratories, coronary care units, hemodialysis rooms or areas, human physiology laboratories, intensive care units and postoperative recovery rooms, shall be provided as follows:

419.3.15.7.1 There shall be a minimum of six duplex electrical receptacles for each patient station.

419.3.15.7.2 Four shall be connected to the critical branch of the essential electrical system, and two of the required number shall be connected to dedicated circuits.

419.3.15.7.3 Two shall be connected to a normal power circuit except in anesthetizing locations where two shall be connected to critical power circuits.

419.3.15.7.4 There shall be no more than two receptacles per circuit.

419.3.15.8 All receptacles shall have engraved cover plates to indicate the panel board and circuit numbers powering the device.

419.3.15.9 Branch circuit over-current devices shall be readily accessible to nursing staff and other authorized personnel.

419.3.16 Fire alarm systems. A fire alarm annunciator panel shall be provided at a 24-hour monitored location. The panel shall indicate the zone of actuation of the alarm, and there shall be a trouble signal indicator. Each smoke compartment shall be annunciated as a separate fire alarm zone. A fire alarm system zone shall not include rooms or

spaces in other smoke compartments and shall be limited to a maximum area of 22,500 square feet (2090 m²).

419.3.17 Nurse call system. (See Section 7.32.G of The Guidelines for other requirements.) A nurse call system shall be provided that will register a call from each patient bed to the nurse station and activate a visual signal at the patient room door and activate a visual and audible signal in the clean workroom, the soiled workroom, the nourishment station and the master station of the nursing unit. In multicorridor nursing units, additional visible signals shall be installed at corridor intersections in the vicinity of nurse stations. In rooms containing two or more calling stations, indicating lights shall be provided for each calling station.

419.3.17.1 Master staff and duty stations may include volume controls, provided the minimum setting provides audibility of 15 decibels above normal ambient noise levels where the station is located.

419.3.17.2 An emergency calling station of the pull cord type shall be provided and shall be conveniently located for patient use in each patient toilet, bath or shower room, but not inside the shower. The call signal shall be cancelled only at the emergency calling station. The emergency station shall activate distinctive audible and visual signals immediately.

419.3.17.3 An emergency resuscitation alarm (Code Blue) calling station shall be provided for staff use in each operating, delivery, recovery LDR, LDRP, emergency, cardiac and intensive nursing care rooms, nurseries and similar rooms.

419.3.17.4 Emergency resuscitative alarm panels (centralized Code Blue) shall be provided at the attending nurse station and at other locations as determined by the facility that are staffed 24 hours per day. Audible signals may be silenced temporarily for a call provided subsequent calls automatically reactivate the audible signal immediately. The alarm panel at the 24-hour staffed station may indicate the nurse station/suite where the call originated in lieu of identifying the bed only when a 24-hour station is not one and the same as the attending nurse station.

419.3.18 Emergency electric service. A Type 1 essential electrical system shall be provided in all hospitals as described in NFPA 99, *Health Care Facilities*. The emergency power for this system shall meet the requirements of a Level 1, Type 10, Class 48 generator as described in NFPA 110, *Emergency Standby Power Systems*.

419.3.18.1 In new construction, the normal main service equipment shall be separated from the emergency distribution equipment by locating it in a separate room. Transfer switches shall be considered emergency distribution equipment for this purpose.

419.3.18.2 Switches for critical branch lighting shall be totally separate from normal switching. The devices or cover plates shall be of a distinctive color. Critical branch switches may be adjacent to normal switches. Switches for life safety lighting are not permitted except as

required for dusk-to-dawn automatic control of exterior lighting fixtures.

419.3.18.3 There shall be selected life safety lighting provided at a minimum of 1 footcandle (10 lux) and designed for automatic dusk-to-dawn operation along the travel paths from the exits to the public way or to safe areas located a minimum of 30 feet (9.144 m) from the building.

419.3.18.4 A minimum of one elevator per bank serving any patient use floor shall be connected to the equipment branch of the essential electric system and arranged for manual or automatic operation during loss of normal power.

419.3.18.5 If a day tank is provided, it shall be equipped with a dedicated low level fuel alarm and a manual pump. The alarm shall be located at the generator derangement panel.

419.3.18.6 Transfer switch contacts shall be of the open type and shall be accessible for inspection and replacement.

419.3.18.7 If required by the facility's emergency food plan, there shall be power connected to the equipment branch of the essential electrical system for kitchen refrigerators, freezers and range hood exhaust fans. Selected lighting within the kitchen and dry storage areas shall be connected to the critical branch of the essential electrical system.

419.3.18.8 Outpatient surgery units which are located in a separate building or on another campus shall have a Type 1 essential electrical system in compliance with NFPA 99, *Health Care Facilities*. The emergency power for this system shall meet the requirements of a Level 1, Type 10, Class 8 generator as described in NFPA 110, *Emergency Standby Power System*.

419.3.19 Lightning protection. A lightning protection system shall be provided for all new buildings and additions in accordance with NFPA 780, *Installation of Lightning Protection Systems*.

419.3.19.1 Where additions are constructed to existing buildings, the existing building's lightning protection system, if connected to the new lightning protection system, shall be inspected and brought into compliance with current standards.

419.3.19.2 A lightning protection system shall be installed on all buildings in which outpatient surgical procedures are provided.

419.3.19.3 There shall be surge protection for all normal and emergency electrical services.

419.3.19.4 Additional surge protection shall be provided for all low voltage and power connections to all electronic equipment in critical care areas and life safety systems and equipment such as fire alarm, nurse call and other critical systems. Protection shall be in accordance with appropriate IEEE Standards for the type of equipment protected.

419.3.19.5 All low-voltage system main or branch circuits entering or exiting the structure shall have surge suppressors installed for each pair of conductors and

shall have visual indication for protector failure to the maximum extent feasible.

419.4 Physical plant requirements for disaster preparedness of new hospital construction.

419.4.1 Definitions. The following definitions shall apply specifically to all new facilities as used herein:

419.4.1.1 "New facility" means a hospital which has not received a Stage II Preliminary Plan approval from the Agency for Health Care Administration pursuant to this section.

419.4.1.2 "Net square footage" means the clear floor space of an area excluding cabinetry and other fixed furniture or equipment;

419.4.1.3 "During and immediately following" means a period of 72 hours following the loss of normal support utilities to the facility.

419.4.1.4 "Occupied patient area(s)" means the location of patients inside of the new facility or in the addition of a wing or floor to an existing facility during and immediately following a disaster. If these patients are to be relocated into an area of the existing facility during and immediately following a disaster, then for purposes of this code, that location will be defined as the "occupied patient area."

419.4.1.5 "Patient support area(s)" means the area(s) required to ensure the health, safety and well-being of patients during and immediately following a disaster, such as a nursing station, clean and soiled utility areas, food preparation area, and other areas as determined by the facility to be kept operational during and immediately following a disaster.

419.4.1.6 "On-site" means either in, immediately adjacent to, or on the campus of the facility, or addition of a wing or floor to an existing facility.

419.4.2 Disaster preparedness construction standards.

The following construction standards are in addition to the physical plant requirements described in Sections 419.2 through 419.3. These minimum standards are intended to increase the ability of the facility to be structurally capable of serving as a shelter for patients, staff and the family of patients and staff and equipped to be self-supporting during and immediately following a disaster.

419.4.2.1 Space standards.

419.4.2.1.1 For planning purposes, each new facility shall provide a minimum of 30 net square feet (2.79 m²) per patient served in the occupied patient area(s). The number of patients to be served is to be determined by the facility administrator.

419.4.2.1.2 As determined by the facility, space for administrative and support activities shall be provided for use by facility staff to allow for care of patients in the occupied patient area(s).

419.4.2.1.3 As determined by the facility, space shall be provided for staff and family members of patients and staff.

419.4.2.2 Site standards.

419.4.2.2.1 All new facilities and additions to existing facilities shall be located above the 100-year flood plain or hurricane Category 3 (Saffir-Simpson scale) hurricane surge inundation elevation, whichever requires the highest elevation; or

419.4.2.2.2 The floor elevation of all new occupied patient area(s) and all patient support area(s) and patient support utilities, including mechanical, electrical (except fuel storage as noted in Section 419.4.2.9.3 of this code) and food services shall be located above the 100-year flood plain or hurricane Category 3 (Saffir-Simpson scale) hurricane surge inundation elevations, whichever requires the highest elevation.

419.4.2.2.3 New additions or floors added to existing facilities, as determined by their site locations, shall meet either the requirements of Section 419.4.2.2.1 or 419.4.2.2.2 of this Code, or be so designed and constructed as to be in compliance with the current standards of the National Flood Insurance Program of the Federal Emergency management Agency, incorporated by reference and available from Federal Emergency management Agency, Federal Insurance Administration, Attn. Publications, P.O. Box 70274, Washington, D.C. 20024.

419.4.2.2.4 Where an off-site public access route is available to the new facility at or above the 100-year flood plain, a minimum of one on-site emergency access route shall be provided that is located at the same elevation as the public access route.

419.4.2.2.5 New landscaping elements shall be located so if damaged they will not block the on-site emergency access route to the facility. Outdoor signs and their foundations shall be designed to meet the wind load criteria of the *Florida Building Code, Building*.

419.4.2.2.6 New light standards and their foundations used for lighting the on-site emergency access route shall be designed to meet the wind load criteria of the American Society of Civil Engineers (ASCE 7), 50-year recurrence interval of wind velocity with appropriate exposure category dependent on site location.

419.4.2.3 Structural standards. Wind load design of the building structure and exterior envelope including exterior wall systems shall be designed in accordance with the code.

419.4.2.4 Roofing standards.

419.4.2.4.1 Roofing membrane material shall resist the uplift forces specified in the code. Roof coverings shall be installed according to the specifications provided by the manufacturer.

419.4.2.4.2 Loose-laid ballasted roofs shall not be permitted.

419.4.2.4.3 All new roof appendages such as ducts, tanks, ventilators, receivers, dx condensing units and decorative mansard roofs and their attachment systems

shall be structurally engineered to meet the wind load requirements of the applicable building code. All of these attachment systems shall be connected directly to the underlying roof structure or roof support structure.

419.4.2.5 Exterior unit standards.

419.4.2.5.1 All exterior window units, skylights, exterior louvers and exterior door units including vision panels and their anchoring systems shall be designed to resist the wind load requirements of the code and the debris impact requirements in Sections 1626.2 through 1626.4.

419.4.2.5.2 Permanently attached protective systems such as shutters and baffling shall be designed to meet the wind load requirements of this code and the debris impact requirements as specified in Sections 1626.2 through 1626.4.

419.4.2.5.3 Removable protective systems designed to intricately fit with the wall/window system of the facility and stored on-site at the facility and that meet the wind load requirements of the code, and debris impact requirements of Sections 1626.2 through 1626.4 may be used to protect the exterior units.

419.4.2.5.4 All anchoring and attachment to the building of both the permanently attached and removable protective systems shall be designed to meet wind load requirements of the code, and impact requirements of Sections 1626.2 through 1626.4. These designs shall be signed, sealed and dated by a Florida-registered structural engineer.

419.4.2.5.5 The glazed openings inside or outside of the protective systems shall meet the cyclical loading requirements specified by Sections 1626.2 through 1626.4.

419.4.2.5.6 All of the exterior impact protective systems shall be designed and installed so that they do not come in contact with the glazing under uniform, impact or cyclic pressure loading. The location or application of exterior impact protective systems shall not prevent required exit egress from the building.

419.4.2.5.7 When not being utilized to protect the windows, the protective systems shall not reduce the clear window opening below that required by this code for the patient room.

419.4.2.6 Heating, ventilation and air-conditioning (HVAC) standards.

419.4.2.6.1 Air-moving equipment, dx condensing units, through-wall units and other HVAC equipment located outside of or on the roof of the new facility or wing or floor addition to an existing facility and providing service to the new facility or wing or floor addition to an existing facility shall be permitted only when either of the following are met:

419.4.2.6.1.1 They are located inside a penthouse designed to meet the wind load requirements of the *Florida Building Code, Building*; or

419.4.2.6.1.2 Their fastening systems are designed to meet the wind load requirements of the *Florida Building Code, Building* and they and all associated equipment are protected as specified in Sections 1626.2 through 1626.4 from damage by horizontal impact by a separate and independent structure that allows access to all parts of the equipment at all times.

419.4.2.6.2 All occupied patient areas and patient support areas shall be supplied with sufficient HVAC as determined by the facility to ensure the health, safety and well-being of all patients and staff during and immediately following a disaster.

419.4.2.6.3 As determined by the facility these selected HVAC systems and their associated support equipment such as a control air compressor essential to the maintenance of the occupied patient and patient support area(s) shall receive their power from the emergency power supply system(s).

419.4.2.6.4 Ventilation air change rates in occupied patient areas shall be maintained as specified in this section during and immediately following a disaster.

419.4.2.6.5 Auxiliary equipment and specialties such as hydronic supply piping and pneumatic control piping shall be located, routed and protected in such a manner as determined by the facility to ensure the equipment receiving the services will not be interrupted.

419.4.2.7 Plumbing standards.

419.4.2.7.1 There shall be an independent on-site supply (i.e., water well) or on-site storage capability (i.e., empty water storage containers or bladders) of potable water at a minimum quantity of 3 gallons (14 L) per in-patient in the new facility or wing or floor addition to an existing facility per day during and immediately following a disaster. For planning purposes the number of in-patients shall be determined in writing by the facility. Hot water in boilers or tanks shall not be counted to meet this requirement.

419.4.2.7.2 There shall be an independent onsite supply or storage capability of potable water at a minimum quantity of 1 gallon (3.7 L) per facility staff, and other personnel in the new facility or wing or floor addition to an existing facility per day during and immediately following a disaster. For planning purposes, the number of these personnel shall be determined in writing by the facility. Hot water in boilers or tanks shall not be counted to meet this requirement.

419.4.2.7.3 The facility shall determine what amount of water will be sufficient to provide for patient services, and shall maintain an on-site supply or on-site storage of the determined amount.

419.4.2.7.4 When utilized to meet the minimum requirements of this rule, selected system appurtenances such as water pressure maintenance house pumps, and emergency water supply well pumps shall take power from the emergency power supply system(s).

419.4.2.8 Medical gas systems standards. The storage, distribution piping system and appurtenances serving the occupied patient area(s) and patient support area(s) shall be contained within a protected area(s) designed and constructed to meet the structural requirements of the code and debris impact requirements as specified by Sections 1626.2 through 1626.4.

419.4.2.9 Emergency electrical generator and essential electrical system standards.

419.4.2.9.1 There shall be an on-site Level 1 emergency electrical generator system designed to support the occupied patient area(s) and patient support area(s) with at least the following support services:

419.4.2.9.1.1 Ice-making equipment to produce ice for the patients served, or freezer storage equipment for the storage of ice for the patients served.

419.4.2.9.1.2 Refrigerator unit(s) and food service equipment if required by the emergency food plan.

419.4.2.9.1.3 At a minimum, there shall be one clothes washer and one clothes dryer for laundry service.

419.4.2.9.1.4 Selected HVAC systems as determined by the facility and other systems required by this code.

419.4.2.9.2 The emergency generator system shall be fueled by a fuel supply stored on-site sized to fuel the generator for 100 percent load for 64 hours or 72 hours for actual demand load of the occupied patient area(s) and patient support area(s) and patient support utilities during and immediately following a disaster, whichever is greater.

419.4.2.9.3 The fuel supply shall either be located below ground or contained within a protected area that is designed and constructed to meet the structural requirements of the code and debris impact requirements of Sections 1626.2 through 1626.4. If an underground system is utilized, it shall be designed so as to exclude the entrance of any foreign solids or liquids.

419.4.2.9.4 All fuel lines supporting the generator system(s) for the occupied patient area(s) and patient support area(s) shall be protected also with a method designed and constructed to meet the structural requirements of the code and debris impact requirements of Sections 1626.2 through 1626.4.

419.4.2.9.5 All panel boards, transfer switches, disconnect switches, enclosed circuit breakers or emergency system raceway systems required to support the occupied patient area(s), patient support area(s) or support utilities shall be contained within a protected area(s) designed and constructed to meet the structural requirements of the code and debris impact requirements of Sections 1626.2 through 1626.4, and shall not rely on systems or devices outside of this protected area(s) for their reliability or continuation of service.

419.4.2.9.6 The emergency generator(s) shall be air or self-contained liquid cooled and it and other essen-

tial electrical equipment shall be installed in a protected area(s) designed and constructed to meet the structural requirements of the code and debris impact requirements of Sections 1626.2 through 1626.4.

419.4.2.9.7 If the facility does not have a permanent onsite optional stand-by generator to operate the normal branch electrical system, there shall be a permanently installed predesigned electrical service entry for the normal branch electrical system that will allow a quick connection to a temporary electrical generator. This quick connection shall be installed inside of a permanent metal enclosure rated for this purpose and may be located on the exterior of the building.

419.4.2.10 Fire protection standards.

419.4.2.10.1 If the facility requires fire sprinklers as part of its fire protection, either of the following shall be met:

419.4.2.10.1.1 On-site water storage capacity to continue sprinkler coverage, in accordance with the requirements of NFPA 13, *Sprinkler Systems*, or a fire watch, conducted in accordance with the requirements of Chapter 59A-3.081(a), *Florida Administrative Code*.

419.4.2.10.2 If the facility provides a fire watch in lieu of water storage to continue sprinkler coverage, then one 4-A type fire extinguisher or equivalent shall be provided for every three or less 2-A fire extinguishers required by NFPA 10, *Portable Extinguishers*. These additional extinguishers shall be equally distributed throughout the area they are protecting.

419.4.2.11 External emergency communications standards. (Reference Chapter 59A-3.081 *Florida Administrative Code* for requirements.)

SECTION 420 NURSING HOMES

420.1 Scope. Nursing homes shall comply with all applicable requirements of the code and the following design and construction standards as described herein and shall have plans reviewed and construction surveyed by the state agency authorized to do so by Chapter 553.80 (1)(c), *Florida Statutes*.

NOTE: For project submission and fee requirements, codes and standards for existing facilities, and other administrative, licensure, and programmatic provisions for nursing homes, see Agency for Health Care Administration [AHCA] Chapter 59A-4, *Florida Administrative Code* (F.A.C.) and Chapter 400 Part II, *Florida Statutes*.

420.2 Codes and standards for the design and construction of nursing homes. Except as modified and required by Section 420 of this code, Chapter 59A-4 *Florida Administrative Code* or by Chapter 400 Part II, *Florida Statutes*, all new nursing homes and all additions, alterations or renovations to existing nursing homes shall also be in compliance with the following codes and standards on the effective date of this code:

420.2.1 The fire codes described in Chapter 69A-53, *Uniform Fire Safety Standards for Hospitals and Nursing Homes, Florida Administrative Code*.

420.2.2 *The Guidelines for Design and Construction of Health Care Facilities* (the Guidelines), Part I, incorporated by reference.

420.2.3 *Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems, Sheet Metal and Air Conditioning Contractors National Association, Inc.* (SMACNA).

420.3 Additional physical plant requirements for nursing homes. In addition to the codes and standards referenced in Section 420.2 of this code, the following minimum standards of construction and specified minimum essential facilities shall apply to all new nursing homes including those that admit children 0 years through 20 years of age and to all additions, alterations or renovations to an existing nursing home including one that admits children 0 years through 20 years of age on the effective date of this code:

420.3.1 Nursing unit. Each nursing unit shall consist of the resident rooms and support areas as required in Sections 420.3.2 and 420.3.3 and shall meet the following standards:

420.3.1.1 Each nursing unit shall be arranged to avoid unnecessary and unrelated travel through the unit.

420.3.1.2 Travel distance from the entrance to a nurses' station, and from a clean utility and a soiled utility room(s) or function(s) to the middle of the entrance door of the farthest resident room served shall be a maximum of 150 feet (45.72 m).

420.3.1.3 Clustered nursing units with resident rooms adjacent to decentralized resident support and service areas, and with the utilization of satellite staff work areas shall be permitted.

420.3.2 Resident rooms. Each resident room shall meet the following standards:

420.3.2.1 Maximum room capacity shall be two residents. Where renovation work is undertaken and the present capacity is more than two residents, maximum room capacity shall be no more than the existing capacity with a maximum capacity of four residents. Nursing homes that admit children 0 through 20 years of age may have a maximum room capacity of four residents in those rooms.

420.3.2.2 Rooms shall have a minimum of 100 square feet (9.29 m²) of clear floor area per bed in multiple-bed rooms and 120 square feet (11.15 m²) of clear floor area in single-bed rooms, exclusive of the space consumed by toilet rooms, closets, lockers, wardrobes, lavatories, alcoves, and door swings into the room or entrance vestibules, whichever is greater. For the purpose of minimum clear floor area, the entrance vestibule is defined as that floor area located between the room entrance door and the room floor area containing the resident bed(s). The dimensions and arrangement of rooms shall be such that there shall be a minimum of 3 feet (0.91 m) between the sides and foot of the bed and any wall or any other fixed obstruction or adjacent bed. For planning purposes, a full-size bed is assumed to be 3 feet 6 inches (1.07 m)

wide by 8 feet (2.43 m) long. In multiple-bed rooms, a clearance of 3 feet 8 inches (1.11 m) to any fixed obstruction shall be available at the foot of each bed to permit the passage of equipment and beds. Where renovation work is undertaken, every effort shall be made to meet these minimum space standards. When this is not possible due to existing physical constraints, with the approval of the agency, resident rooms shall have no less than 80 square feet (7.43 m²) of clear floor area per bed in multiple-bed rooms and 100 square feet (9.29 m²) of clear floor area in single-bed rooms exclusive of the space consumed by toilet rooms, closets, lockers, wardrobes, lavatories, alcoves, and door swings into the room or entrance vestibules, whichever is greater.

420.3.2.3 Each resident room shall have a bedside table, a reading lamp, a well-constructed appropriate bed, and a nonfolding type armchair for each resident. There shall be an over-bed table available for a minimum of 50 percent of the licensed beds in the facility.

420.3.2.4 Each resident room shall be provided with a window(s) that shall have a minimum 20 feet (6.10 m) unobstructed vista measured perpendicularly from the plane of the window. Beds shall be located no more than two deep from windows in renovated construction.

420.3.2.5 A hand-washing facility complete with mixing faucet shall be provided in each resident toilet room and in each resident room without an exclusive toilet room, and in renovated facilities with rooms containing more than two beds.

420.3.2.6 Each resident shall have access to a toilet room without having to enter the general corridor area. One toilet room shall serve no more than four beds and no more than two resident rooms. The door shall be side hinged, swing out from the toilet room, and unless otherwise required by this code, be at least 32 inches (813 mm) wide. The toilet room door that swings open into the resident room shall not impede the swing of any other door that opens into the resident room.

420.3.2.7 Each resident room shall have a wardrobe, locker or closet for each resident. Each wardrobe, locker or closet shall have minimum inside dimensions of 1 foot 10 inches (0.55 m) in depth by 1 foot 8 inches (0.51 m) in width. Each shall be accessible to the resident at all times and shall have a shelf and clothes rod that permits a vertically clear hanging space for full-length garments. When the wardrobe, locker or closet is designed to meet the requirements for accessibility per Chapter 11 of this code, it shall include additional accessible storage area(s) for full-length garments. The shelf may be omitted if the clothing unit provides at least two drawers.

420.3.2.8 In multiple-bed rooms, visual privacy shall be provided for each resident by the installation of flame-retardant cubicle curtains or equivalent built-in devices. The design for privacy shall not restrict resident access to the entrance, resident armchair, hand washing facility, toilet, wardrobe, locker or closet.

420.3.3 Service areas. The size and features of each service area will depend upon the number and type of residents served. Service areas may be arranged and located to serve more than one nursing unit, but at least one such service area shall be provided on each nursing floor. The following service areas shall be located in or be readily accessible to each nursing unit:

420.3.3.1 A centralized staff work area shall be provided. It shall have space for supervisory administrative work activities, charting, and storage. The minimum area required shall be equal to 2 square feet (0.19 m²) for each resident bed served. If a decentralized nursing unit model is utilized, the functions of administrative work, charting and storage may be located among several separate direct care staff work areas. In this case, a centralized staff work area is still required but shall not be required to provide space for these activities and may be reduced in size in accordance with the functional program.

420.3.3.2 A staff toilet room with hand-washing facilities shall be provided conveniently located to each nursing unit.

420.3.3.3 Lockable closets, drawers or compartments shall be provided on the unit for safekeeping of staff personal effects.

420.3.3.4 Staff lounge area(s) shall be provided and may be shared by more than one nursing unit if the lounge is centrally located.

420.3.3.5 A clean utility or clean holding room for storage and distribution of clean supply materials shall be provided. If the room is used for preparing resident care items, it shall contain a work counter, a hand-washing facility, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as a part of a system for distribution of clean and sterile supply materials, the work counter and hand-washing facility requirements may be omitted. The minimum size of the room shall be 60 square feet (5.57 m²).

420.3.3.6 Soiled utility or soiled holding room(s) shall be provided. The soiled utility function shall be comprised of a flushing rim clinical service sink with bedpan rinsing device, a double compartment sink, soiled linen receptacles, waste receptacles and a work counter with a usable minimum work surface area of 6 square feet (0.56 m²). The total minimum size of the function shall be 80 square feet (7.43 m²) and may be allocated among several soiled utility or soiled holding rooms. Rooms used only for the holding of soiled materials need contain only a hand washing facility. All rooms utilized for the holding of soiled materials shall meet the requirements for hazardous areas as required by NFPA 101, *Life Safety Code* as adopted by the *Florida Fire Prevention Code*.

420.3.3.7 If required by the functional program as defined by The Guidelines, a minimum of one sanitizer shall be provided per facility. The sanitizer may be of the hot water or chemical type.

420.3.3.8 A medicine preparation room or a self-contained medicine dispensing unit shall be provided for the

provision of medication distribution and shall be under the visual control of the staff. If a medicine preparation room is utilized, it shall be equipped with a lockable door, have a minimum area of 50 square feet (4.65 m²) and shall contain a refrigerator, locked storage for controlled drugs, a hand washing facility, and a work counter with a minimum of 6 square feet (0.56 m²) of work surface. If a self-contained medicine dispensing unit is utilized, it may be located at the nurses' station, in the clean utility room, in an alcove, or in other spaces convenient for staff control provided the area occupied by the unit does not encroach upon required minimum areas. The dispensing unit may be used in a medicine preparation room as locked storage for controlled drugs within the minimum area of 50 square feet (4.65 m²), however, the standard "cup sinks" provided in many self-contained units shall not be a substitute for the required hand-washing facility. If there is no linen storage in the clean utility room, medicine preparation may be part of the clean utility room in which case an additional 20 square feet (1.8 m²) dedicated for this purpose shall be required. A refrigerator shall also be required if medicine preparation is included in this room.

420.3.3.9 An equipment storage room(s) shall be provided for storage of nursing unit equipment. The minimum area required shall be equal to 2 square feet (.19 m²) for each resident bed served, with no room being less than 30 square feet (2.79 m²) in area.

420.3.3.10 A housekeeping room(s) shall be provided for storage and use of housekeeping supplies and equipment. Each room shall have a service sink. The minimum area required in each room shall be 20 square feet (1.86 m²).

420.3.3.11 A clean linen storage room, closet or area shall be provided. This area may be located within the clean utility or clean holding room. It shall be large enough to accommodate the storage of linen carts. If in compliance with the *Florida Fire Prevention Code* a closed-cart system may be used and stored in an alcove open to the corridor.

420.3.3.12 A nourishment room for serving nourishments between meals shall be provided that shall contain a work counter, refrigerator, storage cabinets, and sink. Ice for residents' consumption shall be provided by an icemaker unit that may serve more than one nourishment station if the nourishment stations are in close proximity to each other. Where the icemaker unit is accessible to residents or the public, it shall be a self-dispensing type. The nourishment room shall include space for trays and dishes used for nonscheduled meal service. Hand-washing facilities shall be in or immediately accessible from the nourishment room.

420.3.3.13 Storage alcove space for a minimum of one wheelchair and one stretcher shall be provided in an area located away from normal traffic.

420.3.3.14 Resident bathing facilities shall be provided with a minimum of one bathtub, hydrotub, or shower for every 20 beds or fraction thereof not otherwise served by

bathing facilities in resident rooms. Residents shall have access to at least one bathing room per floor or unit sized to permit assisted bathing in a tub or shower. The bathtub in this room shall be accessible to residents in wheelchairs and the shower shall accommodate a shower gurney with fittings for a resident in a recumbent position. Other tubs or showers shall be in individual rooms or curtained enclosures with space for private use of the bathing fixture, for drying and dressing and access to a grooming location containing a sink, mirror and counter or shelf. A separate private toilet shall be provided that is directly accessible to each multibathing fixture central bathing area without requiring entry into the general corridor. This toilet may also serve as a toilet training facility.

420.3.4 Resident support areas.

420.3.4.1 Dining, lounges and recreation areas for residents shall be provided. The total area of these spaces shall be a minimum of 35 square feet (3.25 m²) per bed with a minimum total area of 225 square feet (20.90 m²). At least 20 square feet (1.86 m²) per bed shall be available for dining. Additional space may be required for resident day care programs.

420.3.4.2 Storage for supplies, resident needs, and recreation shall be provided. This area shall be on site but not necessarily in the same building as the resident rooms, provided access is convenient. The minimum required area shall be 5 square feet (0.46 m²) per bed up to 600 square feet (55.74 m²).

420.3.4.3 Physical, speech, and occupational therapy units shall provide the following.

420.3.4.3.1 Space for files, records and administrative activities.

420.3.4.3.2 Provisions for wheelchair residents.

420.3.4.3.3 Storage for supplies and equipment.

420.3.4.3.4 Hand-washing facilities within the therapy unit.

420.3.4.3.5 Space and equipment for carrying out each of the types of therapy that the facility will provide.

420.3.4.3.6 Provisions for resident privacy.

420.3.4.3.7 Housekeeping rooms, in or near the unit.

420.3.4.3.8 Resident toilet room(s) usable by wheelchair residents.

420.3.4.4 A barber/beauty room shall be provided with facilities and equipment for resident hair care and grooming. The area of the room shall be a minimum of 200 square feet (18.58 m²) with the least dimension of 12 feet (3.66 m).

420.3.5 Dietary facilities.

420.3.5.1 Dietary facilities shall be provided for residents and others as may be appropriate. No part of the kitchen area may be used as a pass through to the linen/laundry area. The dietary area shall contain the fol-

lowing facilities, in the size and number appropriate for the type of food service selected:

420.3.5.1.1 Storage space, including cold storage, for at least a seven-day supply of food shall be provided.

420.3.5.1.2 Food preparation facilities for cook to serve, cook to chill or a proprietary system of food preparation and adequate space and equipment for production shall be provided.

420.3.5.1.3 Employee dining and serving lines shall not be permitted in the dietary facilities area.

420.3.5.1.4 Hand-washing facilities shall be conveniently located in the food preparation area.

420.3.5.1.5 Facilities for assembly and distribution of resident meals shall be provided.

420.3.5.1.6 Ware washing space shall be located in a room or an alcove separate from the food preparation and serving area. Commercial-type ware washing equipment shall be provided. Space shall also be provided for receiving, scraping, sorting, and stacking soiled tableware and for transferring clean tableware to the use areas. Convenient hand washing facilities shall be available on the soiled dish side of the ware washing area.

420.3.5.1.7 Pot washing facilities shall be provided.

420.3.5.1.8 Storage areas and cleaning facilities for cans, carts, and mobile-tray conveyors shall be provided.

420.3.5.1.9 An office for the food service manager shall be provided.

420.3.5.1.10 A toilet, hand-washing facility and lockers for dietary staff shall be located within the dietary facilities area. A vestibule shall be provided between the toilet and the kitchen.

420.3.5.1.11 A housekeeping room located within the dietary facilities area shall be provided and shall include a service sink and storage space for housekeeping equipment and supplies.

420.3.5.1.12 An icemaker unit shall be provided and may be located in the food preparation area or in a separate room.

420.3.6 Administrative and public areas shall include the following:

420.3.6.1 A covered vehicular drop-off and pedestrian entrance that is located at grade level and that provides shelter from inclement weather shall be provided.

420.3.6.2 An administrative/lobby area shall be provided that shall include a counter or desk for reception and information, a public waiting area, public toilet facilities, public telephone and an electric drinking fountain.

420.3.6.3 General offices shall be provided for business transactions, admissions, social services, private interviews, medical and financial records, and administrative and professional staff. Clerical files and staff office space

shall be provided as needed. At a minimum there shall be a private office for the administrator and director of nursing.

420.3.6.4 A multipurpose room(s) shall be provided for conferences, meetings, and health education purposes, and shall include provisions for the use of visual aids. One multipurpose room may be shared by several services. The minimum area for this room shall be 120 square feet (11.15 m²).

420.3.6.5 Storage for office equipment and supplies shall be provided.

420.3.7 Linen service.

420.3.7.1 Linen service shall be provided that shall have provisions for the storing and processing of clean and soiled linen for appropriate resident care. Processing may be done within the facility, in a separate building on or off site, or in a commercial or shared laundry. Where soiled linen is handled, at a minimum, the following elements shall be included:

420.3.7.1.1 A separate room for receiving and holding soiled linen until ready for pickup or processing shall be provided. Discharge from soiled linen chutes may be received within this room or in a separate room. A hand-washing facility and a utility sink shall be provided.

420.3.7.1.2 A central, clean linen storage and issuing room(s), in addition to the linen storage required at the nursing units shall be provided.

420.3.7.1.3 Parking of clean and soiled linen carts in separate areas from each other and out of traffic shall be provided.

420.3.7.1.4 Hand-washing facilities in each area where unbagged, soiled linen is handled shall be provided.

420.3.7.1.5 When linen is processed off site a service entrance protected from inclement weather for loading and unloading of linen shall be provided.

420.3.7.1.6 When linen is processed in a laundry facility located on site the following additional elements shall be provided:

420.3.7.1.6.1 A laundry processing room(s), separated by walls from other elements of the laundry, with commercial-type laundry equipment for washing and drying. Walls separating the functions of washing and drying are not required.

420.3.7.1.6.2 Storage for laundry supplies.

420.3.7.1.6.3 Arrangement of the laundry processes shall generally provide for an orderly work flow from dirty to clean to minimize cross traffic that might mix clean and soiled operations.

420.3.8 Housekeeping rooms/janitor's closets.

420.3.8.1 Housekeeping rooms or janitor's closets shall be provided throughout the facility as required to maintain a clean and sanitary environment but not less than one housekeeping room/janitor's closet shall be provided for each

floor. Each room shall contain a floor receptor or service sink and storage space for housekeeping equipment and supplies.

420.3.9 Engineering service and equipment areas.

420.3.9.1 Room(s) or separate building(s) for boilers, mechanical and electrical equipment shall be provided as required.

420.3.9.2 Room(s) for the storage of building maintenance supplies and solvents, facility drawings, records and manuals shall be provided as required.

420.3.9.3 A general maintenance area for repair and maintenance shall be provided as required.

420.3.9.4 Yard equipment and supply storage room, if provided, shall be located so that equipment may be moved directly to the exterior.

420.3.10 Details and finishes.

420.3.10.1 Potential hazards such as sharp corners, loose laid rugs or carpets, shall not be permitted.

420.3.10.2 Doors to all rooms containing bathtubs, showers, and water closets for resident use shall be equipped with privacy hardware that permits emergency access without keys. When such rooms have only one entrance or are small, the doors shall open outward and, if on the corridor, shall open into an alcove.

420.3.10.3 All interior doors, except those that automatically close upon smoke detection, shall be side hinged swinging type. Interior corridor doors, except those to small closets not subject to occupancy, shall not swing into the corridor.

420.3.10.4 Operable windows shall be equipped with insect screens.

420.3.10.5 Thresholds and expansion joint covers shall be designed to facilitate use of wheelchairs and carts and to prevent tripping and shall provide a smooth and level transition from surface-to-surface.

420.3.10.6 Grab bars, 1½ inches (38 mm) in diam, shall be installed in all resident showers, tubs, and baths and on both sides of all resident use toilets. Wall-mounted grab bars shall provide a 1½ inch (38 mm) clearance from walls and shall sustain a concentrated load of 250 pounds (113.4 kg).

420.3.10.7 Handrails with a maximum diameter of 1½ inches (38 mm) shall be provided on both sides of all corridors normally used by residents. Mounting height shall be between 36 inches (914 mm) and 42 inches (1067 mm). A clearance of 1½ inches (38 mm) shall be provided between the handrail and the wall. Rail ends shall return to the wall.

420.3.10.8 Each resident hand-washing facility shall have a mirror unless prohibited by the nursing program. Mirror placement shall allow for convenient use by both wheelchair occupants and ambulatory persons. Tops and bottoms may be at levels usable by individuals either sitting or standing. Additional mirrors may be provided for wheelchair occupants, or one separate full-length mirror

located in the resident room may be provided to meet the needs of wheelchair occupants.

420.3.10.9 Provisions for soap dispensing and hand drying shall be included at all hand washing facilities. Those in resident use areas shall be paper or cloth towels enclosed to protect against dust or soil and shall be single-unit dispensing.

420.3.10.10 The minimum ceiling height throughout the facility shall be 8 feet (2.44 m) above the finished floor with the following exceptions:

420.3.10.10.1 Steam boiler and hot water generator rooms shall have ceiling clearances of at least 2 feet 6 inches (0.76 m) above the main header and connecting pipe.

420.3.10.10.2 Ceilings in corridors, storage rooms, resident room entrance vestibules and toilet rooms shall be at least 7 feet 6 inches (2.33 m).

420.3.10.10.3 Ceilings in normally unoccupied spaces and alcoves may be reduced to 7 feet (2.13 m).

420.3.10.10.4 Ceilings in exit passageways shall be a minimum of 8 feet (2.44 m) above the finished floor.

420.3.10.11 Only recessed soap dishes shall be allowed in patient use tubs and showers.

420.3.10.12 Towel bars shall be provided at each bathing facility.

420.3.10.13 A minimum of one electric drinking fountain shall be provided per resident floor.

420.3.10.14 Floor material shall be readily cleanable and appropriate for the location. If composition floor tiles are used, the interstices shall be tight. In residential care and sleeping areas, a base shall be provided at the floor line. Floors in areas used for food preparation and assembly shall be water resistant. Floor surfaces, including tile joints, shall be resistant to food acids. In all areas subject to frequent wet-cleaning methods, floor materials shall not be physically affected by germicidal cleaning solutions. Floors subject to traffic while wet, such as shower and bath areas, kitchens, and similar work areas, shall have a slip resistant surface and floor-to-base intersections shall be watertight. Carpet and padding in resident areas shall be stretched tight, in good repair and free of loose edges or wrinkles that might create hazards or interfere with the operation of wheelchairs, walkers or wheeled carts.

420.3.10.15 Wall finishes shall be washable and, if near plumbing fixtures, shall be smooth and have a moisture-resistant finish. Finish, trim, walls, and floor constructions in dietary and food storage areas shall be free from rodent and insect harboring spaces.

420.3.10.16 Basic wall construction in areas not subject to conditioned air shall be constructed of masonry, cement plaster or moisture-resistant gypsum wallboard.

420.3.10.17 The finishes of all exposed ceilings and ceiling structures in the dietary facilities area shall be readily cleanable with routine housekeeping equipment.

420.3.10.18 Toilet compartment partitions and urinal screens shall not be constructed of enameled steel.

420.3.10.19 All smoke partitions, horizontal exits and exit passageway partitions shall be constructed prior to the construction of intervening walls.

420.3.10.20 Smoke partitions shall be constructed so as to provide a continuous smoke-tight membrane from exterior wall to exterior wall and from the floor to the underside of the deck above. This includes interstitial space and the area above solid fire-tested membranes.

420.3.10.21 Where it is not possible to inspect fire/smoke partitions because of the fire-tested membrane, fire-rated access panels shall be installed adjacent to each side of the smoke partitions at intervals not exceeding 30 feet (9.00 m) and in such locations as necessary to view all surfaces of the partition. Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings shall be effectively and permanently identified with signs or stenciling. Such identification shall be above any decorative ceiling and in concealed spaces. Suggested wording for a fire/smoke partition is as follows: "FIRE AND SMOKE BARRIER – PROTECT ALL OPENINGS."

420.3.10.22 Where electrical conduits, cable trays, ducts and utility pipes pass through the smoke partition, the utilities shall be located so that access is maintained to adjacent wall surfaces and to all damper access panels. The details shall show the studs and reinforcing half studs so that proper support is provided for the wall surfacing material. There shall be a minimum clearance of 6 inches (152 mm) between all conduits, piping, and duct work at corridor walls to facilitate the inspection of these walls.

420.3.11 Elevators. (Where required).

420.3.11.1 All buildings having resident use areas on more than one floor shall have hospital-type electric or hydraulic elevator(s) that shall be in compliance with the requirements of Chapter 30 of this code and Chapter 69A-47, *Florida Administrative Code*, "Uniform Fire Safety Standards for Elevators."

420.3.11.2 In the absence of an engineered traffic study, the minimum number of elevators shall be as follows:

420.3.11.2.1 At least one elevator shall be installed where resident beds are located on any floor other than the main entrance floor.

420.3.11.2.2 When 60 to 200 resident beds are located on floors other than the main entrance floor, at least two elevators, one of which shall be of the hospital-type and capacity, shall be installed.

420.3.11.2.3 When 201 to 350 resident beds are located on floors other than main entrance floor, at least three elevators, two of which shall be of the hospital-type and capacity, shall be installed.

420.3.11.2.4 For facilities with more than 350 resident beds above the main entrance floor, the number

of elevators shall be determined from a facility plan study and from the estimated vertical transportation requirements.

420.3.11.2.5 When the skilled nursing unit is part of a general hospital, elevators may be shared.

420.3.11.3 Cars of elevators shall have inside dimensions that accommodate a resident bed with attendants. Cars shall be at least 5 feet (1.52 m) wide by 7 feet 6 inches (2.29 m) deep. The car door shall have a clear opening of not less than 4 feet (1.22 m).

420.3.11.4 Elevator call buttons shall not be activated by heat or smoke. If employed, light beam door activators shall be used in combination with door-edge safety devices and shall be connected to a system of smoke detectors such that the light control feature will disengage or be overridden if it encounters smoke at any landing.

420.3.12 Water supply and sewage disposal.

420.3.12.1 An approved, accessible, adequate, safe and potable supply of water shall be provided. The water supply shall be accessible and available at all times for drinking, fire protection, culinary, bathing, cleaning and laundry purposes.

420.3.12.2 Hot water shall be supplied to all lavatory and sink plumbing fixtures available for use by residents and staff.

420.3.12.3 An approved, adequate and safe method of sewage collection, treatment and disposal shall be provided for each nursing home.

420.3.13 Ventilating and air-conditioning systems.

420.3.13.1 Mechanical equipment shall be defined as equipment utilized in air-conditioning, heating, ventilating systems and associated electrical, electronic and pneumatic components required for the mechanical equipment to provide the function intended by the application of the equipment. New and existing equipment replacements shall comply with these requirements.

420.3.13.2 Mechanical equipment shall be installed in a designated equipment room(s), or in a space(s) located in an attic(s).

420.3.13.3 If the unit serves only one room it may be located above the ceiling and shall be accessible through an access opening in accordance with this code. Access panels are not required for lay-in ceiling installations, provided the service functions are not obstructed by other above-ceiling construction, such as electrical conduits, piping, audio visual cabling and like equipment components or supports.

420.3.13.4 Ventilation shall be provided by mechanical means in all rooms in new facilities and in all renovated or remodeled rooms. The minimum air quantities and filtration efficiencies shall be met as set forth in Table 420.3.13.7 for those spaces that are listed.

420.3.13.5 For spaces listed in the minimum ventilated rate table, central station type air-handling equipment

shall be used. Package terminal air-conditioning units or fan coils may be used to serve resident rooms and shall be provided with 20-percent filters minimum.

420.3.13.6 System designs utilizing fan coil or package terminal air-conditioning units shall have the outdoor air ventilation damper permanently closed. The ventilation requirement shall be satisfied by a central station type air handling unit provided with a 30-percent filter minimum or as required by the listed space served. Spaces designated for the exclusive use of physical plant personnel need not comply with this requirement.

420.3.13.7 Administrative and other staff-only areas shall be provided with outside air at the minimum rate of 20 cfm (9.43 L/s) per person, and the central system shall have a minimum of 30 percent ASHRAE dust spot efficiency filter.

420.3.13.8 All outdoor air intakes shall be located a minimum of 3 feet (0.91 m) above surrounding surfaces and a minimum of 10 feet (3.05 m) horizontally from any exhaust air or plumbing vent.

420.3.13.9 All filters in systems in excess of 1000 cfm (28.32 m³/min) capacity shall be installed with differential pressure gauges. The filter gauge shall have the range of acceptable filter operation clearly and permanently indicated.

420.3.13.10 Filter housings for 80-percent efficiency filters shall be fully gasketed and sealed with mechanical latching devices capable of exerting and maintaining a continuous, uniform sealing pressure on the filter media when in the latched, closed position.

420.3.13.11 The transfer of air quantities through one space to an adjacent space is not permitted except that the transfer of air to maintain space relative pressure by the under cutting of doors is permitted. The maximum allowable air quantity for door undercuts shall be 75 cfm (35.38 L/s) for single door widths up to 44 inches (1117 mm).

420.3.13.12 Space relative pressure requirements shall be maintained throughout the entire system control range where variable volume systems are utilized.

420.3.13.13 Spaces having exhaust hoods shall have sufficient make-up supply air such that the required pressure relationship will not be affected by the operation of the hood.

420.3.13.14 All supply, return and exhaust ventilation fans shall operate continuously. Dietary hood, laundry area, administrative areas that are separated from all resident areas and support areas and maintenance area supply and exhaust fans shall be exempted from continuous operation.

420.3.13.15 Cooling coil condensate shall be piped to a roof drain, floor drain or other approved location.

420.3.14 Exhaust.

420.3.14.1 Exhaust fans and other fans operating in conjunction with a negative duct system pressure shall be

located at the discharge end of the system. Fans located immediately within the building located at the end of all exhaust ducts shall be permitted. Existing, nonconforming systems need not be brought into compliance when equipment is replaced due to equipment failure.

420.3.14.2 Exhaust hoods in food preparation areas shall be listed or certified by a nationally recognized testing laboratory (NRTL).

420.3.15 Ducts.

420.3.15.1 All new facility construction shall have totally ducted supply, return, exhaust and outside air systems including areas of all occupancy classifications.

420.3.15.2 In new construction, duct system risers penetrating more than one floor shall be installed in vertical fire-rated shafts. Horizontal offsets of the risers shall not be allowed. Fire/smoke dampers shall be installed at duct penetrations of the chase. Existing nonconforming systems shall be brought into compliance when remodel or renovation work is proposed.

420.3.16 Fan and damper control during fire alarm.

420.3.16.1 During a fire alarm, fan systems and fan equipment serving more than one room shall be stopped to prevent the movement of smoke by mechanical means from the zone in alarm to adjacent smoke zones.

420.3.16.2 Air-handling and fan coil units serving exit access corridors for the zone in alarm shall shut down upon fire alarm.

420.3.16.3 Smoke or fire/smoke dampers shall close upon fire alarm and upon manual shutdown of the associated supply, return or exhaust fan.

420.3.17 Plumbing.

420.3.17.1 All plumbing fixtures provided in spaces shall conform to the requirements of Table 420.3.17.2 of plumbing fixtures and minimum trim.

420.3.17.2 The temperature of hot water supplied to resident and staff use lavatories, showers and bath shall be between 105°F (41°C) and 115°F (46°C) at the discharge end of the fixture.

420.3.17.3 Wall-mounted water closets, lavatories, drinking fountains and hand-washing facilities shall be attached to floor-mounted carriers and shall withstand an applied vertical load of a minimum of 250 pounds (113.39 kg) to the front of the fixture.

420.3.17.4 Grease interceptors shall be located outside of the building.

420.3.17.5 Provide deep seal traps for floor drains in resident showers.

420.3.17.6 Food preparation sinks, pot washing, dishwashers, janitor sinks, floor drains, and cart and can wash drains shall run through the grease trap. Garbage disposers shall not run through the grease trap.

**TABLE 420.3.13.7
NURSING HOME MINIMUM VENTILATION RATE⁸**

ROOM NAME OR AREA FUNCTION	SPACE RELATIVE PRESSURE ¹	TOTAL AIR QUANTITIES ²	OUTDOOR AIR QUANTITIES ²	EXHAUST 100 PERCENT	FILTRATION EFFICIENCY PERCENT ^{3,4}
Barber and Beauty	–	10	2.00	Yes	30
Clean Linen, Utility or Holding	OUT	4	2.00	No	30
Dining	–	4	2.00	No	30
Dishwashing	IN	10	–	Yes	30
Exam/Treatment	–	6	2.00	No	80
Food Prep/Kitchen ⁵	–	20	7.00	No	30
Hydro or Physical Therapy	IN	4	2.00	No	30
Housekeeping/ Janitor's Closet	IN	10	–	Yes	30
Laundry/Drying (clean)	OUT	10	3.00	No	30
Laundry/Holding (dirty)	IN	10	–	Yes	30
Laundry/Wash	–	10	3.00	Yes	30
Maintenance ⁶	IN	10	2.00	Yes	30
Medicine Preparation Room	OUT	4	2.00	No	80
Nourishment Station	–	4	2.00	No	30
Oxygen Storage ⁷	IN	8	–	Yes	30
Recreation	–	4	2.00	No	30
Resident Corridor	–	2	1.00	No	30
Resident Room ⁴	–	2	2.00	No	80
Soiled Linen, Utility or Holding	IN	10	–	Yes	30
Storage ⁶	–	2	–	No	30
Toilets and Baths	IN	10	–	Yes	30

Notes:

- Design of the ventilation system shall provide air movement that is generally from clean to less clean areas. Air movement is in relationship to the adjacent room or area and is designated as OUT (positive), IN (negative) and - (neutral). If any form of variable-air-volume or load shedding system is used for energy conservation, it must not compromise the room pressure balancing relationships or the minimum air changes required by the table.
- Tabular numerical values are space volume (cubic feet or cubic ms) per hour.
- Filtration efficiency ratings are based on average dust spot efficiency per ASHRAE 52.
- Filter values apply to central station type air handling units. Where package terminal or fan coil air conditioning units are utilized, filter efficiency value may be 20 percent minimum.
- Includes kitchen hood air quantities.
- Buildings or spaces housing these functions may utilize package terminal or fan coil air conditioning units.
- Provide a dedicated, spark-resistant exhaust fan.
- Rooms or areas where specific ventilation rates are not given in the table shall be ventilated in accordance with the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) 62, *Ventilation for Acceptable Indoor Air Quality* and *ASHRAE Handbook-HVAC Applications*. OSHA standards and NIOSH criteria require special ventilation requirements for employee health and safety within nursing facilities. For multi-function room designations, the most stringent tabular requirement shall govern.

**TABLE 420.3.17.2
PLUMBING FIXTURES AND MINIMUM TRIM**

ROOM/FUNCTION	FIXTURE, FITTING, AND TRIM
Barber and Beauty	G-6
Bed Pan Sanitizer	K-7
Clean Utility Room	C-2
Corridor per nursing unit	I-5
Eye Wash Station(s)	L-5
Exam/Treatment Room	A-2
Housekeeping/Janitor's Closet	E-6
Laundry	A-1; H-1
Medication Preparation Room	C-2
Nourishment Room	C-2
Resident Baths	J-1
Resident bedrooms with three or more beds	A-1
Resident Room Bath	A-1; B-4; J-1
Resident Toilet Rooms	A-1; B-4
Soiled Utility Room(s)	D-2; F-3 AND 4; K-5
Therapy Areas	A-2
Toilet Rooms, public and staff	A-1; B-5

FIXTURE LEGEND

- | | |
|--|--|
| <ul style="list-style-type: none"> A. Lavatory B. Water Closet C. Sink, Single Compartment D. Sink, Double Compartment E. Sink or Receptor, Janitor F. Sink, Clinical Service and Rinsing Device | <ul style="list-style-type: none"> G. Sink, Shampoo H. Sink, Laundry I. Electric Drinking Fountain J. Bathing Facilities or Shower (Note 1) K. Sanitizer w/ rinse water at 140°F (60°C) or chemical rinse. If required by the functional program in The Guidelines. L. Eye Wash Fixtures |
|--|--|

FIXTURE LEGEND

1. Hot and cold supplies.
2. Hot and cold supplies with wrist blades from 3¹/₂ inches (89 mm) to 4¹/₂ inches (114 mm) in length or foot or knee control and a gooseneck spout with discharge a minimum of 5 inches (127 mm) above the fixture rim.
3. Hot and cold supplies with elbow blades a minimum of 6 inches (152 mm) long or foot or knee control.
4. Bedpan rinsing attachment, cold water only.
5. Cold supply.
6. Hot and cold supplies with hose connection and backflow preventer.
7. Hot water supply.

NOTES:

1. Mixing valves used in shower applications shall be of the balanced-pressure type design.
2. If eye wash stations are provided, they shall be installed in accordance with American National Standards Institute (ANSI) Z358.1 for Emergency Eyewash and Shower Equipment.

420.3.17.7 Ice machines, rinse sinks, dishwashers, and beverage dispenser drip receptacles shall be indirectly wasted.

420.3.17.8 Each water service main, branch main, riser and branch to a group of fixtures shall have valves. Stop valves shall be provided for each fixture. Panels for valve access shall be provided at all valves.

420.3.17.9 Backflow preventers (vacuum breakers) shall be installed on bedpan-rinsing attachments, hose bibs and supply nozzles used for connection of hoses or tubing in housekeeping sinks and similar applications.

420.3.17.10 A backflow preventer shall be installed on the facility main water source(s).

420.3.17.11 All piping, except control-line tubing, shall be identified. All valves shall be tagged, and a valve schedule shall be provided to the facility owner for permanent record and reference.

420.3.18. Medical gas and vacuum systems.

420.3.18.1 Provide a medical gas and vacuum system in conformance with the requirements for a Nursing Home as described in NFPA 99, *Health Care Facilities*.

420.3.18.2 Provide a dedicated area for the location of the oxygen system emergency supply source with an impervious, noncombustible, nonpetroleum-based surface located adjacent to the emergency low pressure gaseous oxygen inlet connection. Provision shall be made for securing the vessel to protect it from accidental damage.

420.3.19 Fire pump. (Where required).

420.3.19.1 Fire pumps and ancillary equipment shall be separated from other functions by construction having a 2-hour fire-resistance rating.

420.3.19.2 The fire pump normal service disconnect shall be rated to hold locked rotor current. If the approved normal service disconnect is located on the exterior, it shall be supervised by connection to the fire pump remote annunciator and shall provide a separate fire alarm system trouble indication.

420.3.19.3 When the fire pump is placed on the emergency system in addition to the normal supply, the emergency feeder protective device shall be sized in accordance with maximum rating or settings of Chapter 27 of the *Florida Building Code, Building*.

420.3.19.4 The fire pump transfer switch may be either manual or automatic. If located on the line side of the controller as a separate unit, the switch must be rated for the pump motor locked rotor current indefinitely and must be located in the pump room.

420.3.19.5 Combination fire pump controller and transfer switch units listed by the Underwriter's Laboratories, Inc., as prescribed by Chapter 27 of the *Florida Building Code, Building* are acceptable when the transfer switch has exposable and replaceable contacts, not circuit breaker types, rated for the available short-circuit current.

420.3.19.6 The fire pump shall be installed in a readily accessible location. When it is located on the grade level floor, there shall be direct access from the exterior.

420.3.20 Electrical requirements.

420.3.20.1 All material, including equipment, conductors, controls, and signaling devices, shall be installed to provide a complete electrical system with the necessary characteristics and capacity to supply the electrical facility requirements as shown in the specifications and as indicated on the plans. All materials and equipment shall be listed as complying with applicable standards of Underwriter's Laboratories, Inc., or other nationally recognized testing facilities. Field labeling of equipment and materials will be permitted only when provided by a nationally recognized testing laboratory (NRTL) that has been certified by the Occupational Safety and Health Administration (OSHA) for that referenced standard.

420.3.20.2 For purposes of this section, a resident room, a resident therapy area or an examination room shall be considered a "patient care area" as described in NFPA 99 *Health Care Facilities*, and Chapter 27, Electrical Systems, of this code.

420.3.20.3 Panels located in spaces subject to storage shall have the clear working space per Chapter 27, Electrical Systems, of this code, permanently marked "ELECTRICAL—NOT FOR STORAGE" with a line outlining the required clear working space on the floor and wall.

420.3.20.4 Panels and electrical equipment, other than branch circuit devices serving the corridor, shall not be located in egress corridors in new construction.

420.3.21 Lighting.

420.3.21.1 All spaces occupied by people, machinery and equipment within buildings, approaches to buildings and parking lots shall have electric lighting.

420.3.21.2 Resident bedrooms shall have general lighting and separate fixed night lighting. The night-light shall have a switch at the entrance to each resident's room. A reading light shall be provided for each resident. Resident reading lights and other fixed lights not switched at the door shall have switch controls convenient for use at the luminary. Wall-mounted switches for control of lighting in resident areas shall be of quiet operating type.

420.3.22 Receptacles.

420.3.22.1 Provide one general purpose duplex receptacle on another wall to serve each resident and one additional duplex receptacle at the head of the bed if a motorized bed is provided.

420.3.22.2 Duplex receptacles for general use shall be installed in all general purpose corridors, approximately 50 feet (15.24 m) apart and within 25 feet (7.62 m) of corridor ends.

420.3.23 Fire alarm systems.

420.3.23.1 A fire alarm annunciator panel shall be provided at a single designated 24-hour monitored location. The panel shall indicate audibly and visually, the zone of

actuation of the alarm and system trouble. As a minimum, devices located in each smoke compartment shall be interconnected as a separate fire alarm zone. Annunciator wiring shall be supervised. Annunciator shall clearly indicate the zone location of the alarm. Provide an adjacent zone location map to quickly locate alarm condition.

420.3.24 Nurse call systems.

420.3.24.1 A nurse call system shall be provided that will register a call from each resident bed to the related staff work area(s) by activating a visual signal at the resident room door and activating a visual and audible signal in the clean utility, soiled utility, nourishment station, medication prep and the master station of the nursing unit or subnursing unit. Audible signals may be temporarily silenced, provided subsequent calls automatically reactive the audible signal. In rooms containing two or more calling stations, indicating lights shall be provided for each calling station. In multicorridor nursing units, corridor zone lights shall be installed at corridor intersections in the vicinity of staff work areas.

420.3.24.2 An emergency calling station of the pull cord type shall be provided and shall be conveniently located for resident use at each resident toilet, bath or shower room but not inside of the shower. The call signal shall be the highest priority and shall be cancelled only at the emergency calling station. The emergency station shall activate distinctive audible and visual signals immediately.

420.3.24.3 The nurse call master station shall not block incoming resident calls. The master station control settings shall not prevent the activation of the incoming audible and visual signals.

420.3.24.4 In multiresident rooms, activation of an emergency call shall not cancel a normal call from the same room.

420.3.24.5 A corridor dome light shall be located directly outside of any resident care area that is equipped with a nurse call system.

420.3.25 Emergency electrical system.

420.3.25.1 A Type 1 essential electrical system shall be provided in all nursing homes as described in NFPA 99, *Health Care Facilities*. The emergency power for this system shall meet the requirements of a Level 1, Type 10, Class 48 generator as described in NFPA 110, *Emergency Standby Power Systems*.

420.3.25.2 In new construction, the normal main service equipment shall be separated from the emergency distribution equipment by locating it in a separate room. Transfer switches shall be considered emergency distribution equipment for this purpose.

420.3.25.3 Switches for critical branch lighting shall be completely separate from normal switching. The devices or cover plates shall be of a distinctive color. Critical branch switches may be adjacent to normal switches. Switches for life safety lighting are not permitted except as required for dusk-to-dawn automatic control of exterior lighting fixtures.

420.3.25.4 There shall be selected life safety lighting provided at a minimum of 1 footcandle (10 lux) and designed for automatic dusk-to-dawn operation along the travel paths from the exits to the public way or to safe areas located a minimum of 30 feet (9.14 m) from the building.

420.3.25.5 A minimum of one elevator per bank serving any patient use floor shall be connected to the equipment branch of the essential electric system and arranged for manual or automatic operation during loss of normal power. Elevator cab lighting, controls, and communication and signal systems shall be connected to the life safety branch.

420.3.25.6 If a day tank is provided, it shall be equipped with a dedicated low level fuel alarm and a manual pump. The alarm shall be located at the generator derangement panel.

420.3.25.7 Transfer switch contacts shall be of the open type and shall be accessible for inspection and replacement.

420.3.25.8 If required by the facility's emergency food plan, there shall be power connected to the equipment branch of the essential electrical system for kitchen refrigerators, freezers and range hood exhaust fans. Selected lighting within the kitchen and dry storage areas shall be connected to the critical branch of the essential electrical system.

420.3.26 Lightning protection.

420.3.26.1 A lightning protection system shall be provided for all new buildings and additions in accordance with NFPA 780, *Installation of Lightning Protection Systems*.

420.3.26.2 Where additions are constructed to existing buildings, the existing building's lightning protection system, if connected to the new lightning protection system, shall be inspected and brought into compliance with current standards.

420.3.26.3 There shall be surge protection for all normal and emergency electrical services.

420.3.26.4 Additional surge protection shall be provided for all low-voltage and power connections to all electronic equipment in critical care areas and life safety systems and equipment such as fire alarm, nurse call and other critical systems. Protection shall be in accordance with appropriate IEEE Standards for the type of equipment protected.

420.3.26.5 All low voltage system main or branch circuits entering or exiting the structure shall have surge suppressors installed for each pair of conductors and shall have visual indication for protector failure to the maximum extent feasible.

420.4 Physical plant requirements for disaster preparedness of new nursing home construction.

420.4.1 Definitions. The following definitions shall apply specifically to this section:

420.4.1.1 “New facility” means a nursing home which has not received a Stage II Preliminary Plan approval from the Agency for Health Care Administration pursuant to this section.

420.4.1.2 “Net square footage” means the clear floor space of an area excluding cabinetry and other fixed furniture or equipment.

420.4.1.3 “During and immediately following” means a period of 72 hours following the loss of normal support utilities to the facility.

420.4.1.4 “Occupied resident area(s)” means the location of residents inside of the new facility or in the addition of a wing or floor to an existing facility during and immediately following a disaster. If these residents are to be relocated into an area of the existing facility during and immediately following a disaster, then for these purposes, that location will be defined as the “occupied resident area.”

420.4.1.5 “Resident support area(s)” means the area(s) required to ensure the health, safety and well-being of residents during and immediately following a disaster, such as a staff work area, clean and soiled utility areas, food preparation area and other areas as determined by the facility to be kept operational during and immediately following a disaster.

420.4.1.6 “On site” means either in, immediately adjacent to, or on the campus of the facility, or addition of a wing or floor to an existing facility.

420.4.1.7 “Resident(s) served” means the number of residents as determined by the facility that will be served in the occupied resident area(s) during and immediately following a disaster.

420.4.2 Disaster preparedness construction standards.

The following construction standards are in addition to the physical plant requirements described in Sections 420.2 through 420.3. These minimum standards are intended to increase the ability of the facility to be structurally capable of serving as a shelter for residents, staff and the family of residents and staff and equipped to be self-supporting during and immediately following a disaster:

420.4.2.1 Space standards.

420.4.2.1.1 For planning purposes, each new facility shall provide a minimum of 30 net square feet (2.79 m²) per resident served in the occupied resident area(s). The number of residents to be served is to be determined by the facility administration.

420.4.2.1.2 As determined by the facility, space for administrative and support activities shall be provided for use by facility staff to allow for care of residents in the occupied resident area(s).

420.4.2.1.3 As determined by the facility, space shall be provided for all staff and family members of residents and staff.

420.4.2.2 Site standards.

420.4.2.2.1 All new facilities and additions to existing facilities shall be located above the 100-year flood plain or hurricane Category 3 (Saffir-Simpson scale) hurricane surge inundation elevation, whichever requires the highest elevation, or

420.4.2.2.2 The floor elevation of all new occupied resident area(s) and all resident support area(s) and resident support utilities, including mechanical, electrical (except fuel storage as noted in Section 420.4.2.9.3 of this code) and food services shall be located above the 100-year flood plain or hurricane Category 3 (Saffir-Simpson scale) hurricane surge inundation elevations, whichever requires the highest elevation.

420.4.2.2.3 New additions or floors added to existing facilities, as determined by their site locations, shall meet either the requirements of Section 420.4.2.2.1 or 420.4.2.2.2 of this code, or be so designed and constructed as to be in compliance with the current standards of the National Flood Insurance Program of the Federal Emergency Management Agency, incorporated by reference and available from Federal Emergency Management Agency, Federal Insurance Administration, Attn. Publications, P.O. Box 70274, Washington, D.C. 20024.

420.4.2.2.4 Where an off-site public access route is available to the new facility at or above the 100-year flood plain, a minimum of one on-site emergency access route shall be provided that is located at the same elevation as the public access route.

420.4.2.2.5 New landscaping elements shall be located so if damaged they will not block the on-site emergency access route to the facility. Outdoor signs and their foundations shall be designed to meet the wind load criteria of this code.

420.4.2.2.6 New light standards and their foundations used for lighting the on-site emergency access route shall be designed to meet the wind load criteria of the American Society of Civil Engineers (ASCE 7), 50-year recurrence interval of wind velocity with appropriate exposure category dependent on site location.

420.4.2.3 Structural standards. Wind load design of the building structure and exterior envelope including exterior wall systems shall be designed in accordance with this code.

420.4.2.4 Roofing standards.

420.4.2.4.1 Roofing membrane material shall resist the uplift forces specified in this code. Roof coverings shall be installed according to the specifications provided by the manufacturer.

420.4.2.4.2 Loose-laid ballasted roofs shall not be permitted.

420.4.2.4.3 All new roof appendages such as ducts, tanks, ventilators, receivers, dx condensing units and decorative mansard roofs and their attachment systems shall be structurally engineered to meet the wind

load requirements of this code. All of these attachment systems shall be connected directly to the underlying roof structure or roof support structure.

420.4.2.5 Exterior unit standards.

420.4.2.5.1 All exterior window units, skylights, exterior louvers and exterior door units including vision panels and their anchoring systems shall be designed to resist the wind load requirements of this code and the debris impact requirements as specified by Sections 1626.2 through 1626.4.

420.4.2.5.2 Permanently attached protective systems such as shutters and baffling shall be designed to meet the wind load requirements of this code and the debris impact requirements as specified by Sections 1626.2 through 1626.4.

420.4.2.5.3 Removable protective systems designed to intricately fit with the wall/window system of the facility and stored on site at the facility and that meet the wind load requirements of this code and the debris impact requirements specified by Sections 1626.2 through 1626.4 may be used to protect the exterior units.

420.4.2.5.4 All anchoring and attachment to the building of both the permanently attached and removable protective systems shall be designed to meet wind load requirements of this code and the impact requirements specified by Sections 1626.2 through 1626.4. These designs shall be signed, sealed and dated by a Florida-registered structural engineer.

420.4.2.5.5 The glazed openings inside or outside of the protective systems shall meet the cyclical loading requirements specified by Sections 1626.2 through 1626.4.

420.4.2.5.6 All of the exterior impact protective systems shall be designed and installed so that they do not come in contact with the glazing under uniform, impact or cyclic pressure loading. The location or application of exterior impact protective systems shall not prevent required exit egress from the building.

420.4.2.5.7 When not being used to protect the windows, the protective systems shall not reduce the clear window opening below that required by this code for the resident room.

420.4.2.6 Heating, ventilation and air conditioning (HVAC) standards.

420.4.2.6.1 Air-moving equipment, dx condensing units, through-wall units and other HVAC equipment located outside of or on the roof of the facility shall be permitted only when either of the following are met:

420.4.2.6.1.1 They are located inside a penthouse designed to meet the wind load requirements of this code, or

420.4.2.6.1.2 Their fastening systems are designed to meet the wind load requirements of this code and they and all associated equipment are protected as specified in Sections 1626.2 through

1626.4 from damage by horizontal impact by a separate and independent structure that allows access to all parts of the equipment at all times.

420.4.2.6.2 All occupied resident areas and resident support areas shall be supplied with sufficient HVAC as determined by the facility to ensure the health, safety and well being of all residents and staff during and immediately following a disaster.

420.4.2.6.3 As determined by the facility, these selected HVAC systems and their associated support equipment, such as a control air compressor, essential to the maintenance of the occupied resident and resident support area(s) shall receive their power from the emergency power supply system(s).

420.4.2.6.4 Ventilation air change rates in occupied resident areas shall be maintained as specified in this section, during and immediately following a disaster.

420.4.2.6.5 Auxiliary equipment and specialties such as hydronic supply piping and pneumatic control piping shall be located, routed and protected in such a manner as determined by the facility to ensure the equipment receiving the services will not be interrupted.

420.4.2.7 Plumbing standards.

420.4.2.7.1 There shall be an independent on-site supply (i.e., water well) or on-site storage capability (i.e., empty water storage containers or bladders) of potable water at a minimum quantity of 3 gallons (11 L) per resident served per day during and immediately following a disaster. For planning purposes the number of in-patients shall be determined in writing by the facility. Hot water in boilers or tanks shall not be counted to meet this requirement.

420.4.2.7.2 There shall be an independent on-site supply or storage capability of potable water at a minimum quantity of 1 gallon (4 L) per facility staff, and other personnel in the facility per day during and immediately following a disaster. For planning purposes, the number of these personnel shall be estimated by the facility. Hot water in boilers or tanks shall not be counted to meet this requirement.

420.4.2.7.3 The facility shall determine what amount of water will be sufficient to provide for resident services, and shall maintain an on-site supply or on-site storage of the determined amount.

420.4.2.7.4 When used to meet the minimum requirements of this rule, selected system appurtenances such as water pressure maintenance house pumps and emergency water supply well pumps shall take power from the emergency power supply system(s).

420.4.2.8 Medical gas systems standards. The storage, distribution piping system and appurtenances shall be contained within a protected area(s) designed and constructed to meet the structural requirements of this code and debris impact requirements as specified by Sections 1626.2 through 1626.4.

420.4.2.9 Emergency electrical generator and essential electrical system standards.

420.4.2.9.1 There shall be an on-site Level 1 emergency electrical generator system designed to support the occupied resident area(s) and resident support area(s) with at least the following support services:

420.4.2.9.1.1 Ice-making equipment to produce ice for the residents served, or freezer storage equipment for the storage of ice for the residents served.

420.4.2.9.1.2 Refrigerator unit(s) and food service equipment if required by the emergency food plan;

420.4.2.9.1.3 At a minimum, there shall be one clothes washer and one clothes dryer for laundry service.

420.4.2.9.1.4 Selected HVAC systems as determined by the facility and other systems required by this code.

420.4.2.9.2 The emergency generator system shall be fueled by a fuel supply stored on-site sized to fuel the generator for 100 percent load for 64 hours or 72 hours for actual demand load of the occupied resident area(s) and resident support area(s) and resident support utilities during and immediately following a disaster, whichever is greater.

420.4.2.9.3 The fuel supply shall either be located below ground or contained within a protected area that is designed and constructed to meet the structural requirements of this code and debris impact requirements as specified by Sections 1626.2 through 1626.4. If an underground system is used, it shall be designed so as to exclude the entrance of any foreign solids or liquids.

420.4.2.9.4 All fuel lines supporting the generator system(s) shall be protected also with a method designed and constructed to meet the structural requirements of this code and debris impact requirements as specified by Sections 1626.2 through 1626.4.

420.4.2.9.5 All panel boards, transfer switches, disconnect switches, enclosed circuit breakers or emergency system raceway systems required to support the occupied resident area(s), resident support area(s) or support utilities shall be contained within a protected area(s) designed and constructed to meet the structural requirements of this code and debris impact requirements as specified by Sections 1626.2 through 1626.4, and shall not rely on systems or devices outside of this protected area(s) for their reliability or continuation of service.

420.4.2.9.6 The emergency generator(s) shall be air- or self-contained liquid cooled and it and other essential electrical equipment shall be installed in a protected area(s) designed and constructed to meet the structural requirements of this code and debris impact requirements as specified by Sections 1626.2 through 1626.4.

420.4.2.9.7 If the facility does not have a permanent onsite optional stand-by generator to operate the nor-

mal branch electrical system, there shall be a permanently installed predesigned electrical service entry for the normal branch electrical system that will allow a quick connection to a temporary electrical generator. This quick connection shall be installed inside of a permanent metal enclosure rated for this purpose and may be located on the exterior of the building.

420.4.2.10 Fire protection standards.

420.4.2.10.1 If the facility requires fire sprinklers as part of its fire protection, either of the following shall be met:

420.4.2.10.1.1 On-site water storage capacity to continue sprinkler coverage, in accordance with the requirements of NFPA 13, *Sprinkler Systems*, fire watch, conducted in accordance with the requirements of Chapter 59A-4, *Florida Administrative Code*.

420.4.2.10.2 If the facility provides a fire watch in lieu of water storage to continue sprinkle coverage, then one 4-A type fire extinguisher or equivalent shall be provided for every three or less 2-A fire extinguishers required by NFPA 10, *Portable Extinguishers*, for the area served. These additional extinguishers shall be equally distributed throughout the area they are protecting.

420.4.2.11 External emergency communications standards. (Reference Chapter 59A-4, *Florida Administrative Code* for requirements.)

SECTION 421 AMBULATORY SURGICAL CENTERS

421.1 Scope.

421.1.1 Ambulatory surgical centers shall comply with all applicable requirements of the code and the following design and construction standards as described herein, and shall have plans reviewed and construction surveyed by the state agency authorized to do so by Chapter 553.80(1)(c), *Florida Statutes*.

NOTE: For project submission and fee requirements, codes and standards for existing facilities, and other administrative, licensure and programmatic provisions for ambulatory surgical centers, see Agency for Health Care Administration [AHCA] Rule 59A-5, *Florida Administrative Code* (F.A.C.) and Chapter 395, *Florida Statutes*.

421.2 Codes and standards for the design and construction of ambulatory surgical centers.

421.2.1 Except as modified and required by this section of the code, Chapter 59A-5 *Florida Administrative Code* or by Chapter 395, *Florida Statutes*, all new ambulatory surgical centers and all additions, alterations or renovations to existing ambulatory surgical centers shall also be in compliance with the following codes and standards on the effective date of the code:

421.2.1.1 The fire codes described in Chapter 69A-3.012, Standards of the National Fire Protection Association Adopted, *Florida Administrative Code*.

421.2.1.2 *The Guidelines for Design and Construction of Health Care Facilities* (the Guidelines), Part 1 General and Part 3 Ambulatory Care Facilities incorporated by reference and obtainable from the American Institute of Architects, 1735 New York Ave., N.W., Washington, D.C. 20006-5292;

421.2.1.3 *Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems, Sheet Metal and Air Conditioning Contractors National Association, Inc.* (SMACNA).

421.3 Additional physical plant requirements for ambulatory surgical centers.

421.3.1 In addition to the codes and standards referenced in Section 421.2 of the code, the following minimum standards of construction and specified minimum essential facilities shall apply to all new ambulatory surgical centers and to all new additions, alterations or renovations to existing ambulatory surgical center on the effective date of the code.

421.3.2 Operating rooms. (See The Guidelines for other requirements.)

421.3.2.1 All ambulatory surgical centers shall be equipped with a minimum of one operating room that is in compliance with the requirements of a “Class C” operating room as described in Chapter 9.5.F of The Guidelines.

421.3.2.2 If provided, procedure, examination, or treatment room(s) shall have a minimum clear area of 120 square feet (11.5 m²) and shall meet only the requirement for an examination/treatment room as described in The Guidelines.

421.3.3 Recovery area. Reserved.

421.3.4 Details and finishes. (See The Guidelines for other requirements.)

421.3.4.1 No doors shall swing into the corridor except those to small closets or small mechanical or electrical rooms that cannot be usefully occupied with the doors in the closed position.

421.3.4.2 All exit access corridor doors must be equipped with automatic positive latching hardware.

421.3.4.3 Permanently installed single service paper towel dispensers and soap dispensers shall be provided at all lavatories and sinks used for handwashing.

421.3.4.4 The use of sliding pocket doors to patient use toilets shall not be permitted.

421.3.5 Elevators where required. (See The Guidelines for other requirements.)

421.3.5.1 All new ambulatory surgical centers located in multistory buildings where patient treatment areas are located on other than the exit floor shall have at least one 2,500 pound (933 kg) capacity elevator that shall be in compliance with the requirements of Section 421.3.13.5 of this code and the requirements of Chapter 30 of the code.

421.3.5.2 This required elevator shall be sized to accommodate an ambulance stretcher 76 inches (1931 mm) long and 24 inches (610 mm) wide in the horizontal position. This elevator shall be identified with a sign indicating it as the ambulance stretcher elevator.

421.3.6 Air-conditioning, heating and ventilating systems.

421.3.6.1 Air-handling equipment shall be located either on the roof of the building it serves or in mechanical equipment rooms unless it serves only one room and is located in that room. In buildings with multiple uses, tenants or occupancies, the licensed health care areas required by this code to maintain filter efficiencies and relative air pressure relationships shall be served by separate ducted mechanical air supply, return and exhaust systems.

421.3.6.2 Ventilation shall be provided in all rooms in new and remodeled facilities by mechanical means. Rooms requiring positive or negative relative pressures, shall maintain the air quantities as required between the supply, return or exhaust at a minimum of 75 cfm (2.13 m³/min) for room areas 100 square feet (9 m²) or larger and 50 cfm (1.42 cu.m./min.) for rooms less than 100 square feet (9.29 m²).

421.3.6.3 Variable volume systems shall not be permitted in surgical procedures rooms and recovery rooms.

421.3.6.4 Friable duct linings exposed to air movement shall not be used in ducts, terminal boxes or other systems supplying operating rooms and recovery rooms, unless terminal filters of at least 90-percent efficiency are installed downstream of linings. Flexible duct work shall have a continuous metal inner liner encased by insulating material with an outer vapor jacket conforming to UL 181 unless the flexible duct meets the following criteria:

- The duct conforms to UL Class 1 Air Duct, Standard 181 with minimum rated air velocity of 4,000 feet per minute, and is pressure rated for a minimum of 4-inches water gage positive pressure and 1-inch water gage negative pressure.
- The inner core of the duct is constructed of Chlorinated Polyethylene (CPE) material encircling a steel helix bonded to the CPE.
- The duct has a fire-retardant metalized vapor barrier that is reinforced with crosshatched fiberglass scrim having a permanence of not greater than 0.05 perms when tested in accordance with ASTM E 96 Procedure A.
- The duct has passed an impact test similar to the UL 181 standard, conducted by a nationally recognized testing laboratory (NRTL) except it shall use a 25-pound weight dropped from a height of 10 feet. As a result of the test, the inner and outer surfaces of the sample shall not have ruptured, broken, torn, ripped, collapsed or separated in order for the duct to pass the test. In addition, the helix shall rebound to a cross-sectional elliptical area

not less than 80 percent of the original test sample diameter.

The use of flexible duct shall be limited to flexible air connector applications.

421.3.7 Fan and damper control during fire alarm.

421.3.7.1 During a fire alarm, fan systems and fan equipment shall be stopped to prevent the movement of smoke by mechanical means from the zone in alarm to adjacent smoke zones or to adjacent areas within the smoke zone if there is only one zone in the facility.

421.3.7.2 Fan control shall be designed so as to minimize the interruption of heating, ventilating and air conditioning in compartments remote from the compartment in alarm.

421.3.7.3 Fan control shall not interfere with the continuous operation of exhaust systems conveying ethylene oxide or other hazardous chemicals and fumes or systems required to operate continuously for the health and safety of occupants. Air-handling systems shall be designed to allow for continuous operation of all such systems and to minimize movement of smoke by mechanical means from the zone in alarm.

421.3.8 Plumbing fixtures.

421.3.8.1 Plumbing shall comply with the *Florida Building Code, Plumbing*.

421.3.8.2 All examination or treatment rooms shall be equipped with hand washing facilities.

421.3.8.3 Wall-mounted lavatories and hand washing facilities shall be attached to floor-mounted carriers and shall withstand an applied vertical load of a minimum of 250 pounds (113 kg) on the front of the fixture.

421.3.9 Fire pump.

421.3.9.1 Where required in new construction, fire pumps and ancillary equipment shall be separated from other functions by construction having a 2-hour fire-resistance rating.

421.3.9.2 The fire pump normal service disconnect shall be rated to hold locked rotor current indefinitely. If the approved normal service disconnect is located on the exterior, it shall be supervised by connection to the fire pump remote annunciator and shall provide a separate fire alarm system trouble indication.

421.3.9.3 When the fire pump is placed on the emergency system in addition to the normal supply, the emergency feeder protective device shall be sized in accordance with maximum rating or settings of Chapter 27 of the *Florida Building Code, Building*.

421.3.9.4 The fire pump transfer switch may be either manual or automatic. If located on the line side of the controller as a separate unit, the switch must be rated for the pump motor locked rotor current indefinitely and must be located in the pump room.

421.3.9.5 Combination fire pump controller and transfer switch units listed by the Underwriter's Laboratories,

Inc., as prescribed by Chapter 27 of the *Florida Building Code, Building* are acceptable when the transfer switch has exposable and replaceable contacts, not circuit breaker types, rated for the available short-circuit current.

421.3.9.6 The fire pump shall be installed in a readily accessible location. When it is located on the grade level floor, there shall be direct access from the exterior.

421.3.10 Electrical requirements. (See The Guidelines for other requirements.)

421.3.10.1 All material, including equipment, conductors, controls, and signaling devices, shall be installed to provide a complete electrical system with the necessary characteristics and capacity to supply the electrical facilities shown in the specifications or indicated on the plans. All materials and equipment shall be factory listed as complying with applicable standards of Underwriter's Laboratories, Inc., or other similarly established standards of a nationally recognized testing laboratory (NRTL) that has been certified by the Occupational Safety and Health Administration (OSHA) for that referenced standard.

421.3.10.2 There shall be documentation for equipotential grounding in all patient care areas, building service ground electrode systems, and special systems such as fire alarm, nurse call, paging, generator, emergency power and breaker coordination.

421.3.10.3 All spaces occupied by people, machinery and equipment within buildings, and the approaches thereto, and parking lots, shall have electric lighting.

421.3.10.4 Patients' recovery rooms shall have general lighting. Fixed lights not switched at the door shall have switch controls convenient for use at the luminaries. All switches for control of lighting in recovery areas shall be of the quiet operating type.

421.3.10.5 Operating rooms shall have general lighting for the room in addition to localized specialized lighting provided by a special lighting unit required at the surgical table. The type of special lighting unit shall be as specified by the functional program of the facility. Each special lighting unit for localized lighting at the surgical table shall be permanently installed and permanently connected to an independent circuit that shall be powered from the critical branch. In addition, a minimum of one general purpose lighting fixture shall be powered from a normal circuit in all operating rooms.

421.3.10.6 Duplex receptacles in operating rooms and post-operative recovery rooms, shall be provided as follows:

421.3.10.6.1 There shall be a minimum of six duplex electrical receptacles for each patient station.

421.3.10.6.2 Four shall be connected to the critical branch of the essential electrical system, and two of the required number shall be connected to dedicated circuits.

421.3.10.6.3 Two shall be connected to a normal power circuit except in anesthetizing locations where two shall be connected to critical power circuits.

421.3.10.6.4 There shall be no more than two duplex receptacles per circuit.

421.3.10.7 All receptacles shall have engraved cover plates to indicate the panel board and circuit numbers powering the device.

421.3.10.8 Branch circuit over-current devices shall be readily accessible to nursing staff and other authorized personnel.

421.3.10.9 Nonmetallic sheathed cable or similar systems are not permitted for power and lighting wiring in any facility.

421.3.10.10 Panel boards located in spaces subject to storage shall have the clear working space per Chapter 27 of the *Florida Building Code, Building*. "ELECTRICAL ACCESS—NOT FOR STORAGE" shall be permanently marked on the floor and wall about the panel. Panel boards shall not be located in egress corridors.

421.3.10.11 Duplex receptacles for general use shall be installed approximately 50 feet (15 240 mm) apart in all general purpose corridors and within 25 feet (7620 mm) of ends of corridors.

421.3.11 Nurses' calling system.

421.3.11.1 In facilities which contain more than eight recovery beds, or where recovery beds are not in direct view from the nurse's station, a nurses' calling system shall be provided. Each recovery bed shall be provided with a call button. Two call buttons serving adjacent beds may be served by one calling station. Call shall activate a visual and audible signal at the nurses' station and in the clean workroom and soiled workroom. Call shall also activate a corridor dome light located at each patient recovery position.

421.3.11.2 A nurses' call emergency system shall be provided at each patient toilet and dressing room. Activation shall be by a pull cord conveniently located for patient use. This system will activate distinct audible and visual signals in the recovery room nurses' station and in the surgical suite nurses' station. The emergency call system shall be designed so that signal light activation will remain lighted until turned off at patient's calling station.

421.3.11.3 A corridor dome light shall be located directly outside of any patient use area that is equipped with a nurse call system.

421.3.12 Fire alarm systems.

421.3.12.1 A fire alarm annunciator panel shall be provided per facility or building at a location that is constantly attended during the facility's hours of operation and shall announce a fire alarm from any manual or automatic fire alarm device. The panel shall indicate the zone of actuation of the alarm, and there shall be a trouble signal indicator. Each smoke compartment shall be announced as a separate fire alarm zone. A fire alarm

system zone shall not include rooms or spaces in other smoke compartments and shall be limited to a maximum area of 22,500 square feet (2090 m²).

421.3.13 Emergency electric system.

421.3.13.1 A Type 1 essential electrical system shall be provided in ambulatory surgical centers as described in NFPA 99, *Health Care Facilities*. The emergency power for this system shall meet the requirements of a Level 1, Type 10, Class 8 generator as described in NFPA 110, *Emergency Standby Power Systems*.

421.3.13.2 In new construction, the normal main service equipment shall be separated from the emergency distribution equipment by locating it in a separate room. Transfer switches shall be considered emergency distribution equipment for this purpose.

421.3.13.3 Switches for critical branch lighting shall be totally separate from normal switching. The devices or cover plates shall be of a distinctive color. Critical branch switches may be adjacent to normal switches. Switches for life safety lighting are not permitted except as required for dusk-to-dawn automatic control of exterior lighting fixtures.

421.3.13.4 There shall be selected life safety lighting provided at a minimum of 1 footcandle (10 lux) and designed for automatic dusk-to-dawn operation along the travel paths from the exits to the public way or to safe areas located a minimum of 30 feet (9.144 m) from the building.

421.3.13.5 A minimum of one elevator serving any patient treatment floor shall be in compliance with Section 421.3.5 of this code and shall be connected to the equipment branch of the essential electric system and arranged for manual or automatic operation during loss of normal power.

421.3.13.6 If a day tank is provided, it shall be equipped with a dedicated low level fuel alarm and a manual pump. The alarm shall be located at the generator derangement panel.

421.3.13.7 Transfer switch contacts shall be of the open type and shall be accessible for inspection and replacement.

SECTION 422 BIRTHING CENTERS

422.1 Scope. All birthing centers shall comply with the following design and construction standards as described herein.

Note: Other administrative and programmatic provisions may apply. See Agency of Health Care Administration [AHCA] Rule 59A-11, *Florida Administrative Code* and Chapter 383, *Florida Statutes*.

422.2 Physical environment, water supply and fire safety.

422.2.1 At least one birthing room shall be maintained which is adequate and appropriate to provide for the equipment, staff, supplies and emergency procedures required for the physical and emotional care of a maternal client, her support person and the newborn during labor, birth, and the recovery period.

422.2.2 The birth center shall be designed to provide adequate space for the following:

422.2.2.1 Birth rooms shall be located to provide unimpeded, rapid access to an exit of the building which will accommodate emergency transportation vehicles.

422.2.2.2 Adequate fixed or portable work surface areas shall be maintained for use in the birth room.

422.2.2.3 A separate space for a clean area and a contaminated area; if it is not feasible to provide such separate areas, special procedures shall be established for the disposal of infectious waste. Sanitary waste containers, soiled linen containers, storage cabinets and an autoclave, pressure cooker or other effective sterilization equipment shall be available.

422.2.2.4 Prenatal and postpartum examinations which will provide privacy for the patient, hand-washing facilities and the appropriate equipment for staff.

422.2.2.5 Medical record storage, client interviews, instruction and waiting rooms.

422.2.3 Toilet and bathing facilities.

422.2.3.1 A toilet and lavatory shall be maintained in the vicinity of the birth room.

422.2.3.2 Hand-washing facilities shall be in or immediately adjacent to the birth room.

422.2.3.3 A bathtub or shower shall be available for client use.

422.2.3.4 All floor surfaces, wall surfaces, water closets, lavatories, tubs, showers, shall be kept clean, and all appurtenances of the structures shall be of sound construction, properly maintained, in good repair and free from safety hazards.

422.2.4 There shall be provisions and facilities for secure storage of personal belongings and valuables of clients.

422.2.5 There shall be provisions for visual privacy for each maternal client and her support person.

422.2.6 Hallways and doors providing access and entry into the birth center and birth room shall be of adequate width and conformation to accommodate maneuvering of ambulance stretchers and wheelchairs.

422.2.7 All areas of the facility shall be well lighted and shall have light fixtures capable of providing at least 20 footcandles (200 lux) of illumination at 30 inches (762 mm) from the floor to permit observation, cleaning and maintenance. Light fixtures shall be properly maintained and kept clean.

422.2.8 All housing facilities shall have adequate ventilation and be kept free of offensive odors.

422.2.8.1 If natural ventilation is utilized, the opened window area for ventilation purposes shall be equal to one-tenth of the floor space in the residential area.

422.2.8.2 When mechanical ventilation or cooling systems are employed, the system shall be properly maintained and kept clean. Intake air ducts shall be designed and installed so that dust or filters can be readily

removed. In residence areas and segregation rooms with solid doors, mechanical ventilation systems shall provide a minimum of 10 cubic feet (.3 m³) of fresh or filtered recirculated air per minute for each client occupying the area.

422.2.8.3 All toilet rooms shall be provided with direct openings to the outside or provided with mechanical ventilation to the outside.

422.2.9 Adequate heating and cooling facilities shall be provided to maintain a minimum temperature of 68°F (20°C) and maximum temperature of 78°F (26°C) at a point 20 inches (508 mm) above the floor.

422.2.10 All heating devices shall comply with fire prevention provisions found in Rule 69A-3, Fire Prevention, General Provision, *Florida Administrative Code*.

422.2.11 Laundry.

422.2.11.1 Where laundry facilities are provided, laundry facilities shall be of sound construction and shall be in good repair and clean. Adequate space shall be provided and areas shall be designated for the separation of clean and soiled clothing, linen and towels.

422.2.11.2 Laundry rooms shall be well lighted and properly ventilated. Clothes dryers shall be vented to the exterior.

422.2.12 Insect and rodent control. Facilities shall be kept free of all insects and rodents. All outside openings shall be effectively sealed or screened with 16 mesh screening or equivalent to prevent entry of insects or rodents.

422.2.13 Outdoor areas. Outdoor areas shall be well drained. Indoor and outdoor recreational areas shall be provided with safeguards designed for the needs of the residents.

422.2.14 Water supply.

422.2.14.1 Drinking water shall be accessible to all clients. When drinking fountains are available, the jet of the fountain shall issue from a nozzle of nonoxidizing impervious material set at an angle from the vertical. The nozzle and every other opening in the water pipe or conductor leading to the nozzle shall be above the edge of the bowl so that such nozzle or opening will not be flooded in case a drain from the bowl of the fountain becomes clogged. The end of the nozzle shall be protected by nonoxidizing guards to prevent persons using the fountain from coming into contact with the nozzle. Vertical or bubbler drinking fountains shall be replaced with approved type water fountains or be disconnected. When no approved drinking fountains are available, clients shall be provided with single service cups which shall be stored and dispensed in a manner to prevent contamination. Common drinking cups are prohibited.

422.2.14.2 Hot and cold running water under pressure and at safe temperature, not to exceed 110°F (43°C) to prevent scalding, shall be provided to all restrooms, lavatories and bathing areas.

422.2.15 Sewage disposal.

422.2.15.1 All sanitary facilities shall comply with the requirements of the *Florida Building Code, Plumbing*.

422.2.15.2 For facilities with nine or more birth rooms, mop sinks or curbed areas with floor drains shall be available in convenient locations throughout the facility to facilitate cleaning and for the proper disposal of cleaning water.

422.2.16 Fire control. Each birth center shall provide fire protection through the elimination of fire hazards, the installation of necessary safeguards such as extinguishers and smoke alarms to insure rapid and effective fire control.

422.2.16.1 To safeguard all clients, the birth center shall have:

422.2.16.1.1 “No Smoking” signs prominently displayed in those areas where smoking is not permitted.

422.2.16.1.2 Fire regulations and evacuation route prominently posted.

422.2.16.2 The written fire control plan approved by the appropriate local fire authority shall contain provisions for prompt reporting of all fires, extinguishing fires, protection of personnel and guests, evacuation, and cooperation with fire-fighting authorities.

422.2.16.3 New centers’ carpeting must comply with the maximum flame spread rating of 75 in accordance with ASTM E 84 test as required under Chapter 69A-3.012 Standards of the National Fire Protection Association Adopted, *Florida Administrative Code*. Those existing centers not having affirmative evidence of complying with such flame spread rating shall establish fire control measures including the prohibition of smoking in carpeted areas. Such procedures shall be approved by the authority having jurisdiction.

SECTION 423 STATE REQUIREMENTS FOR EDUCATIONAL FACILITIES

423.1 Scope: Public educational facilities. Public educational facilities shall comply with the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal. These are minimum standards; boards may impose more restrictive requirements. Additional requirements for public educational facilities in Florida, including public schools and public community/junior colleges, are found in these standards.

Note: Other administrative and programmatic provisions may apply. See Department of Education Rule 6-2 and Chapter 1013, *Florida Statutes*.

423.2 Public schools and community colleges general requirements.

423.2.1 Owner. Each school board and community college board of trustees is deemed to be the owner of facilities within its respective jurisdiction. Boards shall provide for enforcement of the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal, including standards for health, sanitation, and others as required by law.

423.2.2 Exemption from local requirements. All public educational and ancillary plants constructed by a school board or a community college board are exempt from all other state, county, district, municipal, or local building codes, interpretations, building permits, and assessments of fees for building permits, ordinances, road closures, and impact fees or service availability fees as provided in Section 1013.37(1)(a), *Florida Statutes*.

423.3 Code enforcement.

423.3.1 School boards and community college boards. Section 553.80(6), *Florida Statutes*, provides options for plan review services and inspections by school boards and community college boards.

423.3.2 Owner review and inspection. A school board or community college board which undertakes the construction, remodeling, renovation, lease, or lease-purchase of any educational plant or ancillary facility, or day labor project, regardless of cost or fund source, shall review construction documents as required by law in Section 1013.38, *Florida Statutes*, and Section 553.80(6), *Florida Statutes*, and shall ensure compliance with requirements of law, rule, and the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal. Section 553.80(6), *Florida Statutes*, states that district school boards and community college boards shall provide for plan review and inspections for their projects. They shall use personnel certified under Part XII of Chapter 468, *Florida Statutes* to perform the plan reviews and inspections or use one of the options provided in Section 1013.38, *Florida Statutes*. Under this arrangement, school boards and community college boards are not subject to local government permitting, plan review, and inspection fees.

423.3.3 Local government review and inspection. As an option to the owner providing plan review and inspection services, school boards and community college boards may use local government code enforcement offices who will not charge fees more than the actual labor and administrative costs for the plan review and inspections. Local government code enforcement offices shall expedite permitting. Any action by local government not in compliance with Section 553.80(6), *Florida Statutes*, may be appealed to the Florida Building Commission, which may suspend the authority of that local government to enforce the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal on the facilities of school boards and community college boards.

423.3.4 Other regulatory agencies. Boards shall coordinate the planning of projects with state and regional regulatory and permitting agencies, as applicable. Other state or local agencies may inspect new construction or existing facilities when required by law; however, such inspections shall be in conformance with the code as modified by this section.

423.3.5 Day labor projects. Any one construction project estimated to cost \$200,000 or less where bonafide board employees or contracted labor provide the work. Day labor projects are subject to the same *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal as new construction.

423.3.6 Routine maintenance. Maintenance projects are subject to the same *Florida Building Code* and *Uniform Fire Safety Standards* as adopted by the State Fire Marshal as new construction. Chapter 489, *Florida Statutes*, exempts boards from the use of a licensed general contractor for projects up to \$200,000 where bonafide board employees provide the work. Maintenance projects estimated to cost more than \$200,000 and which include construction, renovation and/or remodeling, shall be reviewed for compliance with the code.

423.3.7 Certificate of occupancy. New buildings, additions, renovations, and remodeling shall not be occupied until the building has received a certificate of occupancy for compliance with codes that were in effect on the date of permit application.

423.3.8 Reuse and prototype plans shall be code updated with each new project.

423.4 Reference documents. School Boards and Community College Boards of Trustees. In addition to complying with the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal, and other adopted standards and this section, public educational facilities and sites shall comply with applicable federal and state laws and rules.

423.4.1 Rule 6-2 [*State Requirements for Educational Facilities (SREF)*]. A Florida Department of Education document which includes required design standards, standards for rehabilitation of historical resources, capital outlay project process requirements, and various agencies having jurisdiction during project planning and construction.

423.4.2 FEMA. Federal Emergency management Agency. Rules and Regulations 44 CFR, Parts 59 and 60, Revised as of October 1, 1995. In Flood Zones A1 through A30, AE, AH, and AO (100-year flood plain) the finished floor at the lowest entry level shall be a minimum 1 foot (305 mm) above the base flood elevation.

423.4.3 Florida statutes and state rules. Including, but not limited to, Chapters 1013, 240, 255, 468, 471, 481, 489, 553, 633, and Section 287.055, *Florida Statutes*, and various state rules as applicable to specific projects.

423.4.4 Accessibility requirements for children's environments. U.S. Department of Justice and the U.S. Architectural and Transportation Barriers Compliance Board.

423.4.5 Handbook for public playground safety. Playgrounds and equipment shall be designed and installed using the *Handbook for Public Playground Safety* by the U. S. Consumer Product Safety Commission, and the *ASTM/CPSC Playground Audit Guide* as applicable.

423.4.6 ANSI Z53.1. *American National Standard Safety Color Code for marking Physical Hazards*, is used in shops where machinery requires marking and safety zones.

423.4.7 ASCE 7. American Society of Civil Engineers.

423.4.8 Life Cycle Cost Guidelines for Materials and Buildings for Florida's Public Educational Facilities, available from the Department of Education, Bureau of Educational Facilities shall be considered.

423.5 Definitions.

423.5.1 "Assembly" occupancies are buildings or portions of buildings used for gatherings of 50 or more persons, such as auditoriums, gymnasiums, multipurpose rooms, classrooms and labs, cafeterias, stadiums, media centers and interior courtyards. Assembly occupancies include adjacent and related spaces to the main seating area, such as stages, dressing rooms, workshops, lobbies, rest rooms, locker rooms, and store rooms. School board and community college facilities shall follow the requirements of *Uniform Fire Safety Standards* as adopted by the State Fire Marshal for assembly spaces.

423.5.2 "Board" means a district school board and a community college board of trustees.

423.5.3 "Boiler" is a fuel-fired, heat-producing appliance with a minimum input capacity of (60,000) Btu per hour and intended to supply hot water or steam. Boilers and the inspection of boilers shall comply with the Boiler Safety Act of 1987.

423.5.4 "Certificate of occupancy" is documentation issued by an authority having jurisdiction which indicates inspection and approval of completion of a construction project pursuant to the requirements of Florida law.

423.5.5 "Courtyard" is a court or enclosure adjacent to, or surrounded by, a building(s) and/or walls.

423.5.5.1 "Exterior courtyard" is a courtyard which is not roofed, has a minimum width of 40 feet (1219 mm), and

- a. has an opening a minimum width of 40 feet (1219 mm), with no obstructions, on at least one end, or
- b. has fences between the buildings for security purposes, and the required exiting capacity of the courtyard is provided for by means of doors or gates from the courtyard.

An exterior courtyard may be considered exterior space and used for exiting of adjacent spaces. For an exterior courtyard with an opening between 40 feet (1219 mm) and 60 feet wide (18 288 mm), the building walls and wall openings must meet the requirements of *Florida Building Code, Building Tables 601 and 602* and the maximum travel to the courtyard opening/exit shall not exceed 150 feet (45,720 mm) from any point within the courtyard. If the minimum courtyard width exceeds 60 feet (18 288 mm), the travel distance to a courtyard opening/exit may exceed 150 feet (945 720 mm).

423.5.5.2 "Enclosed courtyard" is a courtyard which is not roofed by more than 50 percent of the courtyard area and which is substantially surrounded by a building(s) on two sides or more and each opening to the exterior is less than 40 feet (1219 mm) in width. The courtyard area shall be calculated for maximum occupancy as an assembly space and the number and size of remotely located exits shall be calculated for the maximum possible load. The maximum possible load is the greater of the calculated capacity of the courtyard or the load imposed by the surrounding spaces. An enclosed courtyard may be used as a component of exit access provided that the walls and wall openings meet the requirements of *Florida Building Code, Building Tables 601 and 602* and the maximum travel to the exit discharge does not exceed 150 feet (45 720 mm) from any point within the enclosed court-

yard. An enclosed courtyard cannot serve as the exterior for exiting or for emergency rescue openings.

423.5.5.3 “Roofed courtyard” is a courtyard which is roofed by more than 50 percent of the courtyard area in any manner. Courtyards may be used for assembly spaces and may not be used as a component of exiting from adjacent spaces.

423.5.6 “Facility” is additionally defined as follows:

423.5.6.1 “Ancillary facility” is a building or other facility necessary to provide district-wide support services, such as an energy plant, bus garage, warehouse, maintenance building, or administrative building.

423.5.6.2 “Ancillary plant” is buildings, site, and site improvements necessary to provide district-wide vehicle maintenance, storage, building maintenance activities, or administrative functions necessary to provide support services to an educational program.

423.5.6.3 “Auxiliary facility” consists of the support spaces located at educational facilities and plants which do not contain student stations but are used by students, such as libraries, administrative offices, and cafeterias.

423.5.6.4 “Educational facility” consists of buildings and equipment, structures, and special educational use areas that are built, installed, or established to serve primarily the educational purposes and secondarily the social and recreational purposes of the community.

423.5.6.5 “Educational plant” comprises the educational facilities, site, and site improvements necessary to accommodate students, faculty, administrators, staff, and the activities of the educational program.

423.5.6.6 “Existing facility” is a facility owned, rented or leased.

423.5.6.7 “Leased facility” is a facility not owned, but contracted for use.

423.5.6.8 “Permanent facility” is a facility designed for a fixed location.

423.5.6.9 “Relocatable/portable facility” is a building which is designed with the capability of being moved to a new location.

423.5.6.10 “Modular facility” is a structure which, when combined with other modules and/or demountable roof and/or wall sections, forms a complete building. This facility may be relocatable.

423.5.7 “Maintenance and repair” is the upkeep of educational and ancillary plants including, but not limited to, roof or roofing replacement, short of complete replacement of membrane or structure; repainting of interior or exterior surfaces; resurfacing of floors; repair or replacement of glass and hardware; repair or replacement of electrical and plumbing fixtures; repair of furniture and equipment; replacement of system equipment with equivalent items meeting current code requirements providing that the equipment does not place a greater demand on utilities, structural requirements are not increased, and the equipment does not adversely affect the function of life safety systems; traffic control

devices and signage; and repair or resurfacing of parking lots, roads, and walkways. Does not include new construction, remodeling, or renovation, except as noted above.

423.5.8 “New construction” is any construction of a building or unit of a building in which the entire work is new. An addition connected to an existing building is considered new construction.

423.5.9 “Open plan building” is any building which does not have corridors defined by permanent walls and is entirely open or divided by partitions which may be easily rearranged.

423.5.10 “Open plan instructional space” is an arrangement of two or more class areas with no permanent partitions or wall separations.

423.5.11 “Owner” of facilities within a respective jurisdiction consists of each school board and community college board of trustees is deemed to be the owner of facilities within its respective jurisdiction.

423.5.12 “Permit” for construction is documentation issued by an authority having jurisdiction which indicates approval of construction plans prepared pursuant to the requirements of Florida law.

423.5.13 “Remodeling” is the changing of existing facilities by rearrangement of space and/or change of use. Only that portion of the building being remodeled must be brought into compliance with the *Florida Building Code* and *Uniform Fire Safety Standards* as adopted by the State Fire Marshal unless the remodeling adversely impacts the existing life safety systems of the building.

423.5.14 “Renovation” is the rejuvenating or upgrading of existing facilities by installation or replacement of materials and equipment. The use and occupancy of the spaces remain the same. Only that portion of the building being renovated must be brought into compliance with the *Florida Building Code* and *Uniform Fire Safety Standards* as adopted by the State Fire Marshal unless the renovation adversely impacts the existing life safety systems of the building.

423.5.15 “Separate atmosphere” is the individual volumes of air in a building which are divided by smoke proof barriers to limit contamination of the air by smoke and fumes during a fire.

423.5.16 “Separate building” for the purpose of separate fire alarm systems or sprinkler systems is a structure separated from other buildings by 60 feet (18 288 mm) or more, or as required by other sections of this code.

423.5.17 “Student-occupied space” is any area planned primarily for use by six or more students.

423.6 Administration of public education projects.

423.6.1 Occupancy during construction. School board and community college board facilities, or portions of facilities, shall not be occupied during construction unless exits, fire detection and early warning systems, fire protection, and safety barriers are continuously maintained and clearly marked at all times. Construction on an occupied school board site shall be separated from students and staff by secure barriers. Prior to issuance of the notice to proceed, a safety plan shall be provided by the contractor which clearly delin-

ates areas for construction, safety barriers, exits, construction traffic during the various phases of the project and when conditions change. Where heavy machinery, as is used for earth moving or scraping, is required to work on a school board's occupied site, the work shall be separated from occupants by secure double barriers with a distance of 10 feet (3048 mm) in between. New construction, remodeling or renovations in existing facilities shall not reduce the means of egress below the requirements for new buildings; safe means of egress from a student-occupied space may be accomplished as authorized by NFPA 101, Florida edition as adopted by the *Florida Fire Prevention Code*. New construction (additions) shall not block or reduce safe means of egress.

423.6.2 Contractor toxic substance safety precautions. When hazardous chemicals as defined by 29 CFR 1910.1200, OSHA Hazard Communication Standard are to be used during the maintenance, renovation, remodeling, or addition to an existing facility, the contractor shall notify the administrator in writing at least three working days before any hazardous chemical is used. The notice shall indicate the name of each of the hazardous chemicals to be used, where and when they will be used, and a copy of a Material Safety Data Sheet (MSDS) for each hazardous chemical. The contractor shall comply with the safety precautions and handling instructions set forth in the MSDS. Copies of hazardous waste manifests documenting disposal shall be provided to the facility's administrator who will notify occupants of the anticipated presence of toxic substances during the maintenance, renovation, remodeling, or addition to an existing facility.

423.6.3 Flammable or explosive substances. No flammable or explosive substances or equipment shall be introduced during a remodeling or renovation project in a facility of normally low or ordinary hazard classification while the building is occupied.

423.7 Life safety.

423.7.1 Separate exits. In assembly occupancies, each required exit must exit into a separate atmosphere or to the exterior, to be considered as a separate exit.

423.7.2 Exit access. Exit access shall not be through a toilet room, storage room, or similar space, or any space subject to being locked.

423.7.3 Location of fire extinguishers and blankets. Fire extinguishers may be located inside student-occupied spaces provided they are placed adjacent to the primary exit door, and the room door remains unlocked when the facility is occupied, and a permanently affixed sign, with a red background and white letters, reading "FIRE EXTINGUISHER INSIDE" is placed on the outside adjacent to the door. Fire extinguisher cabinets shall not be locked. Fire blankets shall be located in each laboratory and each shop where a fire hazard may exist. Fire extinguishers and fire blankets shall be readily accessible and suitable for the hazard present and shall not be obstructed or obscured from view. Extinguishers and blankets shall be on hangers or brackets, shelves, or cabinets so that the top of the extinguisher or blanket is not more than 54 inches (1318 mm) above finish floor (AFF) and complies with state and federal accessibility requirements. All extinguishers shall be installed

and maintained in accordance with NFPA. Extinguishers shall remain fully charged and operable at all times and have a current tag to indicate compliance.

423.7.4 Common fire alarm. Buildings within 60 feet (18 288 mm) of each other shall have a common fire alarm system. Emergency shelters shall have the fire alarm panel located in the space identified as the shelter manager's office.

423.7.5 Fire alarm sending stations. Sending stations may be located inside student-occupied spaces, adjacent to the primary exit door only if the door to the occupied space is unlocked at all times while the facility is occupied. When located inside a student occupied space, a permanently affixed sign reading "FIRE ALARM PULL STATION INSIDE" shall be placed outside that space adjacent to the door. This sign shall have a red background with white letters. Sending stations shall be mounted to meet accessibility requirements.

423.7.6 Automatic shut off. The fire alarm system shall shut off gas and fuel oil supplies which serve student-occupied spaces or pass through such spaces. The shutoff valve shall be located on the exterior at the service entrance to the building. The shutoff valve shall be of the manual reset type.

423.7.6.1 Kitchen gas supplies. Kitchen gas supplies shall be shut-off by activation of the kitchen hood fire suppression system. The shut-off valve shall be installed in accordance with the manufacturer's instructions and recommendations.

423.7.6.2. Emergency power. The fire alarm system shall not shut off gas supplies which serve emergency power sources.

423.7.7 Unoccupied rooms and concealed spaces. Rooms or spaces for storage, custodial closets, mechanical rooms, spaces under stages with wood structures and other unoccupied or unsupervised spaces in a building shall have automatic fire alarm system detector devices installed. Any concealed space with exposed materials having a flame spread rating greater than Class A, including crawl spaces under floors, interstitial spaces between ceiling and floor or roof above and attic spaces, shall be equipped with heat detector devices. Smoke and heat detector devices shall be installed in accordance with NFPA 72.

423.7.7.1 Fully sprinklered buildings. In fully sprinklered buildings, fire alarm detection devices are not required except where specified in the *Florida Fire Prevention Code*.

423.7.8 Boiler rooms. Each boiler room shall be separated from the remainder of the building by one hour fire rated construction or shall be separate from other buildings by 60 feet (18 288 mm), and shall have an out-swinging door opening directly to the exterior. A fire door swinging into the boiler room shall also be provided for any opening into the interior of the building. There shall be no opening into any corridor or area designed for use by students.

423.8 General requirements for new construction, additions, renovation, and remodeling.

423.8.1 Codes and standards. Educational facilities owned by school boards and community college boards shall meet

the construction requirements of the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal, state and federal laws and rules, and this section for Florida's public educational facilities for new construction, remodeling and renovation of existing facilities. This is a minimum standard; boards may impose more restrictive safety and level of quality standards for educational, auxiliary, and ancillary facilities under their jurisdiction, provided they meet or exceed these minimum requirements.

423.8.1.1 Educational occupancy. School board educational facility projects whether owned, lease-purchased or leased shall comply with the educational occupancy and assembly occupancy portions of the above referenced codes as applicable, except where in conflict with this section. The support spaces such as media centers, administrative offices and cafeterias and kitchens located within educational facilities are not separate occupancies.

423.8.1.2 Business occupancy. Community college board educational facility projects whether owned, lease-purchased or leased shall comply with the business occupancy and the assembly occupancy of the above referenced codes as applicable, except where in conflict with this section.

423.8.1.3 Ancillary facility. School board and community college board ancillary facilities such as warehouses or maintenance buildings, shall use the applicable occupancy section of the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal. Ancillary facilities on educational plant sites shall be separated from the educational facility as required by code.

423.8.2 Space standards. School board and community college board facility sizes shall use standards in the "Size of Space and Occupant Design Criteria Table" found in the Department of Education document, "State Requirements for Educational Facilities (SREF)." Exiting from occupied spaces shall comply with Table 1004.1.2 of the *Florida Building Code, Building*.

423.8.3 Construction type. School board and community college buildings including auxiliary, ancillary and vocational facilities shall comply with the following:

423.8.3.1 Noncombustible Type I, II or IV. The minimum construction type for one- and two-story public educational facilities shall be noncombustible Type I, II or IV construction or better.

423.8.3.1.1 Interior nonload-bearing wood studs or partitions shall not be used in permanent educational and auxiliary facilities or relocatable buildings.

Exception: Historic buildings to maintain the fabric of the historic character of the building.

423.8.3.2 Type I. Facilities three stories or more shall be Type I construction.

423.8.3.3 Type IV. When Type IV construction is used, wood shall be exposed and not covered by ceilings or other construction.

423.8.3.4 Exceptions to types of construction:

1. Covered walkways open on all sides may be Type V construction.

2. Single story dugouts, press boxes, concession stands, related public toilet rooms, detached covered play areas, and nonflammable storage buildings that are detached from the main educational facility by at least 60 feet (1829 mm), may be Type V construction.

423.8.4 Standards for remodeling and/or renovation projects. Portions of buildings being remodeled and/or renovated shall be brought into compliance with current required *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal as required by the plan review authority in its best judgment.

423.8.5 Leased facilities. Leased facilities shall be brought into compliance with applicable occupancy requirements of the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal prior to occupancy.

423.8.6 Asbestos prohibited. The federal Asbestos Hazard Emergency Response Act, (AHERA) 40 CFR, Part 763, as revised July 1, 1995, prohibits the use of any asbestos containing materials in any public education construction project and requires certification of same by the architect of record.

423.8.7 Life cycle cost guidelines for materials and building systems. An analysis shall be included, as required by Section 1013.37(1), *Florida Statutes*, which evaluates building materials and systems, life cycle costs for maintenance, custodial, operating, and life expectancy against initial costs, as described in Section 1013(1)(e)4, *Florida Statutes*. Standards for evaluation of materials are available from the department in a publication entitled *Life Cycle Cost Guidelines for materials and Building Systems for Florida's Public Educational Facilities*.

423.8.8 Safe school design. School boards should design educational facilities and sites including pre-K through 12, vocational and community colleges to enhance security and reduce vandalism through the use of "safe school design" principles. Safe school design strategies are available from DOE/educational facilities and include but are not limited to the following:

423.8.8.1 Natural access and control of schools and campuses.

423.8.8.2 Natural surveillance of schools and campuses both from within the facility and from adjacent streets by removing obstructions or trimming shrubbery.

423.8.8.3 School and campus territorial integrity; securing courtyards, site lighting, building lighting.

423.8.8.4 Audio and motion detection systems covering ground floor doors, stairwells, offices and areas where expensive equipment is stored.

423.8.8.5 Designs which will promote the prevention of school crime and violence. Exterior architectural features which do not allow footholds or handholds on exterior walls, tamperproof doors and locks, nonbreakable glass or shelter window protection system; also landscaping and tree placement should be designed so they do not provide access to roofs by unauthorized persons. Sections of schools commonly used after hours should be separated by doors or other devices from adjacent

areas to prevent unauthorized access. Install locks on roof hatches; apply slippery finishes to exterior pipes.

423.8.8.6 Exterior stairs, balconies, ramps, and upper level corridors around the perimeter of buildings should have open-type handrails or other architectural features to allow surveillance.

423.8.8.7 Open areas, such as plazas, the building's main entrance, parking lots, and bicycle compounds should be designed so they are visible by workers at workstations inside the buildings.

423.9 Structural design.

423.9.1 Load importance factor. Structural design shall comply with code requirements and wind loads as stipulated by the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal. Design shall be based on ASCE 7, with a wind load importance factor for educational facilities of 1.15.

423.10 Site requirements.

423.10.1 Fencing. Fencing for school board educational plants shall be of a material which is nonflammable, safe, durable, and low maintenance, provides structural integrity, strength and aesthetics appropriate for the intended location. Fence heights shall be in compliance with local zoning regulations. Access shall be provided for maintenance machinery. Prohibited materials for nonagricultural educational plants include razor wire, barbed wire and electrically charged systems.

423.10.1.1 Required locations. Fencing is required to separate students from potential harm, and shall be provided in the following locations:

423.10.1.1.1 Kindergarten through grade 12. Exposed mechanical, plumbing, gas, or electrical equipment located on ground level.

423.10.1.1.2 Kindergarten through grade 5. Special hazards as identified by the authority having jurisdiction including retention ponds whose permanent water depth or whose water depth over a 24-hour period exceeds 1 foot (305 mm), deep drainage ditches, canals, highways, and play fields adjacent to roadways.

423.10.1.1.3 Kindergarten through grade 12. All child care and kindergarten play areas.

423.10.2 Walks, roads, drives, and parking areas. Walks, roads, drives, and parking areas on educational and ancillary sites shall be paved. Roads, drives, and parking areas shall be in compliance with Department of Transportation (DOT) road specifications and striped in compliance with DOT paint specifications. All paved areas shall have positive drainage.

423.10.2.1 Covered walks. All buildings in K-12 educational facilities shall be connected by paved walks and accessible under continuous roof cover. New relocatable classroom buildings shall be connected to permanent buildings by paved covered walks where applicable. Roofs for covered walks shall extend 1 foot (305 mm) beyond each side of the designated walkway width. Gut-

ters or other water funneling devices shall prevent storm water from pouring onto or draining across walks.

423.10.2.2 Accessible walks and bridges. Accessible walks shall connect building entrance(s) to accessible parking, public transportation stops, public streets, sidewalks, loading and drop-off zones, and other facilities within the site as required by the accessibility standards. School board sites where educational plants are separated by highways shall be connected by overhead pedestrian bridges.

423.10.2.3 Drainage. Soil, grass, and planting beds shall provide positive drainage away from sidewalks, but shall not fall away at more than a 3-percent gradient slope for a minimum distance of 5 feet (1524 mm) from the edge. The location of all drains, grates, drop inlets, catch basins, other drainage elements and curb cuts shall be out of the main flow of pedestrian traffic.

423.10.2.4 Vertical drops. Walls, railings, or other physical barriers which are at least a minimum 12 inches (305 mm) in height, shall define and protect any vertical drop between joining or abutting surfaces of more than 6 inches (152 mm) but less than 18 inches (457 mm) in height. Any vertical drop of 18 inches (457 mm) or more shall be protected by a wall or guardrail a minimum of 42 inches (1067 mm) in height.

423.10.2.5 Roads and streets. Educational and ancillary site access shall consist of a primary road and another means of access to be used in the event the primary road is blocked. Stabilized wide shoulders of the primary road, unobstructed by landscaping, planters, light fixtures, poles, benches, etc., which allow a third lane of traffic, may satisfy the requirement for the other means of access. Driveways shall not completely encircle a school plant, to allow student access to play areas without crossing roads; vehicular and pedestrian traffic shall not cross each other on the site; bus driveways and parent pick-up areas shall be separated.

423.10.2.6 Bus drives. Bus drives on educational sites shall be designed so that buses do not have to back up. The minimum width shall be 24 feet (7315 mm) for two-lane traffic. The turning radius on educational and ancillary sites and for turning off public access streets shall be as follows: one-way traffic, 60 feet (18 288 mm) minimum measured to the outside curb or edge of the traffic lane; two-way traffic, 60 feet (18 288 mm) minimum measured to the centerline of the road.

423.10.2.7 Vehicle parking areas. Vehicle parking areas shall comply with minimum parking space requirements in this section. Except for parking space requirements to meet federal and state accessibility laws, where alternate transportation or parking arrangements are available the parking area requirements may be reduced from these standards if sufficient justification documentation is provided and if the review authority approves the reduction based on the justification. Overflow parking areas may utilize alternative parking surfaces which facilitate water absorption rather than runoff when approved for use by the review authority.

This requirement usually applies to a percentage of the parking spaces, not all of them.

Exception: Accessible parking spaces shall be hard surface.

423.10.2.8 Minimum parking requirements.

423.10.2.8.1 Faculty and staff. One space for each member.

423.10.2.8.2 Visitors. One space for every 100 students.

423.10.2.8.3 Community clinics where provided. Ten spaces, including one accessible space.

423.10.2.8.4 High schools. One space for every 10 students in grades 11 and 12.

423.10.2.8.5 Vocational schools. One space for every two students.

423.10.2.8.6 Community colleges. One space for every two students.

423.10.2.8.7 Accessible parking. Parking spaces designated for persons with disabilities shall comply with the ADA, Chapter 11 of the *Florida Building Code, Building*, and Section 316.1955, *Florida Statutes*.

423.10.3 Site lighting required. Design, construction, and installation of exterior security lighting for educational and ancillary facilities shall be provided for:

423.10.3.1 Auto, bus, and service drives and loading areas.

423.10.3.2 Parking areas.

423.10.3.3 Building perimeter.

423.10.3.4 Covered and connector walks between buildings and between buildings and parking.

423.10.3.5 Lighting for parking areas. Parking area lighting standards shall be designed to withstand appropriate wind loads. Parking areas shall be illuminated to an average maintained horizontal footcandle, measured at the surface as follows:

423.10.3.5.1 Parking areas—1 footcandle (10 lux).

423.10.3.5.2 Covered and connector walks—1 footcandle (10 lux).

423.10.3.5.3 Entrances/exits—2 footcandles (20 lux).

423.10.3.6 Building exteriors. Building exteriors, perimeters, and entrances may be illuminated to the minimum number of footcandles, measured at the surface with a suggested uniformity ratio of 2:1 as follows:

423.10.3.6.1 Entrances—5 footcandles (50 lux).

423.10.3.6.2 Building surrounds—1 footcandle (10 lux).

423.10.3.7 Shielding. Exterior lighting shall be shielded from adjacent properties.

423.10.4 Building setbacks. Building setbacks from the property line, including relocatables, shall, at a minimum, be 25 feet (7620 mm) or shall comply with local setback requirements if less than 25 feet (7620 mm).

423.10.5 School board playgrounds, equipment, and athletic fields. Playgrounds, equipment, and athletic fields shall be accessible, compatible with the educational facility served and shall comply with the following:

423.10.5.1 Kindergarten play areas shall be separated from other play areas, fenced, and shall be directly accessed from the kindergarten classrooms.

423.10.5.2 Playgrounds and equipment shall be designed and installed using the *Handbook for Public Playground Safety* by the U.S. Consumer Product Safety Commission, and the *ASTM/CPSC Playground Audit Guide* as applicable, resulting in facilities which are safe, structurally sound, verminproof, and do not have jagged or sharp projections.

423.10.5.3 Direct access from the school buildings shall be provided to play areas and athletic fields without crossing public roads, on-site traffic lanes, and parking lots.

423.10.5.4 Related facilities such as toilets, concessions, storage, shower and locker rooms, bleachers, press boxes, observation platforms, scoreboards, and dugouts shall be designed to meet code requirements and the occupant capacity anticipated for the program.

423.10.6 Exterior signage. All permanent and free-standing exterior signs shall be designed to withstand appropriate wind loads. Illuminated signs shall comply with the electrical and installation requirements of the *Florida Building Code* and *Uniform Fire Safety Standards* as adopted by the State Fire Marshal.

423.10.6.1 Site signage shall not create visual barriers at entrances, sidewalks, roads or road intersections.

423.10.6.2 Accessible routes, including parking, building directories, building identification, and accessible entrances shall be marked by exterior signage in conformance with federal and state accessibility laws.

423.10.7 Landscaping. Refer to Section 1013.64(5), *Florida Statutes*, for school board and community college requirements. Xeriscape is defined in Section 373.185, *Florida Statutes*.

423.10.8 Transmission line right-of-way. Buildings, play areas, and common use areas shall not be located within a high-voltage power transmission line right-of-way.

423.10.9 School site master plan. New schools planned after the effective date of these standards shall include, as applicable: facility design capacity; floodplain locations; covered accessible walks; infrastructure locations for, and extensions of, technology, telephone, electricity, fire alarm; and, where applicable, water and sewer utilities, and relocatables.

423.11 Wood: fire-retardant treated wood (FRTW). FRTW shall not be used in permanent educational facilities.

Exception: Only FRTW which does not contain ammonium phosphates, sulfates, or halides, may be used in roof structures of noncombustible Type II ancillary facilities as allowed by the *Florida Building Code*, but only under the following conditions:

423.11.1 Fire-retardant treated wood. All FRTW must meet the requirements of Section 2303.2.

423.11.2 Inspection access panels shall be provided for annual inspection of the condition of the structure and the connectors.

423.11.3 Evidence of compliance shall be provided.

423.12 Roofing.

423.12.1 Class A materials. All roofing materials shall be labeled Class A per ASTM E108 and shall be certified by a nationally recognized independent testing laboratory. All roofing systems shall be installed within the limitations of the test procedure for surfacing, deck cross slope, and combustibility.

423.12.2 Insulation and moisture protection. Insulation, moisture protection, roofing, thermal requirements, fireproofing and firestopping shall be designed and constructed in compliance with the the *Florida Building Code and Uniform Fire Safety Standards* as adopted by the State Fire Marshal. Cellulose insulation may only be used if it is treated with fire-retardant borate based chemicals; the contractor shall retain bag labels on site for review by building inspector.

423.12.3 Phased installation prohibited. All new installed materials shall be sealed from moisture penetration at the end of each day. The contractor shall provide the architect/engineer (A/E) of record a “final statement of compliance” for the board.

423.12.4 Manufacturer’s one-year inspection. The roof shall be inspected by the manufacturer’s representative within one year of acceptance by the board.

423.13 Doors and windows.

423.13.1 Doors. All spaces with an occupant load of six or more students, regardless of use, shall have a door opening directly to the exterior, or as required in the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal, in buildings of three stories or less shall have a rescue window opening directly to the exterior, or shall be fully sprinklered. All doors and gates from spaces with an occupant load of six or more students, regardless of use or location, shall swing in the direction of exit travel, shall be of the side hinged type, and shall always be operable from the inside by a single operation and without a key.

423.13.1.1 Doors for steam rooms, locker rooms, shower rooms and group toilet rooms shall swing in the direction of exit travel, and shall always be operable for exiting from the inside.

423.13.1.2 No mirrors, draperies, curtains, equipment, furnishings, decorations, or other objects which may confuse, obstruct, or conceal the exit or the direction of exit shall be placed to obstruct a means of egress.

423.13.2 Recessed. Doors when fully opened shall not extend into the required exit width of corridors, except for door thickness and required hardware. Doors may either be recessed and hinged to swing 90 degrees, or if flush with corridor wall shall contain a view panel and be hinged to swing 180 degrees.

423.13.3 Special function doors. Special function doors, including balanced doors and overhead doors, shall not be used in a means of egress.

423.13.4 Overhead and sliding security grilles. Security grilles shall have an adjacent side-hinged door swinging in the direction of exit and readily opened from the inside.

423.13.5 Gates. Gates used to secure buildings or used for egress shall be side-hinged and readily opened from the side from which egress is to be made without the use of a key or special tool, or shall have a adjacent side hinged door, or doors as required for occupant load, swinging in the direction of exit and readily opened from the inside without a key.

423.13.6 Hardware. Doors and gates shall be equipped with hardware which will allow egress at all times without assistance. No padlock, chain, hasp, lock, deadbolt, or other device shall be installed at any time on any door used for exiting. Doors which by code require closers and other doors subject to wind exposure shall be equipped with closers to prevent slamming and uncontrolled opening. All doors opening into smoke-tight exit access corridors shall be self-closing or automatic closing. Smoke doors in walls used to divide corridors into separate atmospheres shall be provided with push-pull plates and are not required to have positive latching. As an exception to Section 1008.1.8.6, delayed egress locks may be used in media centers, alternative education centers, and exceptional student education centers. Delayed egress locks are prohibited at time-out rooms at all locations.

423.13.7 Safety glazing: Panels and storefronts. In addition to the requirements of Section 2406.3, the following is considered a hazardous location and requires safety glazing: Glazed panels within 48 inches (1219 mm) of a door, excluding transoms or vertical panels above 6 feet 8 inches (2031 mm).

423.13.7.1 All glazing in hazardous locations shall be safety glazing meeting the requirements of the *Florida Building Code, Building*, Section 2406.

423.13.7.2 Large glass panels shall be subdivided by a built-in horizontal member or a permanent chair rail not less than 1½ inches (38 mm) in width, located between 24 and 36 inches (610 and 914 mm) above the floor.

423.13.8 Windows.

423.13.8.1 Natural light and ventilation. Natural light and ventilation requirements for new construction shall be satisfied by windows with operable glazing, providing a net free open area equivalent to 5 percent of the floor area, in all classrooms on the perimeter of buildings, where required by Chapter 1013, *Florida Statutes*. Auxiliary spaces, music rooms, gyms, locker and shower facilities, laboratories requiring special climate control, and large group instructional spaces having a capacity of more than 100 persons need not have operable windows for the purpose of providing natural light and ventilation. Emergency access, emergency rescue, and secondary means of egress windows may be included in the calculation to comply with this requirement.

423.13.8.2 Projecting and awning windows. Projecting and awning windows shall not be located below door head height if in, or adjacent to, a corridor or walkway.

423.13.8.3 Security/storm screens or grills. If a security/storm screen or grille is installed on the outside of an emergency access, rescue or egress window assembly then that security/storm screen or grille together with the emergency rescue window assembly shall be operable from the inside by a single operation without the use of tools to allow for exit under emergency conditions. The emergency rescue window shall be identified by signage, and the release device shall be readily identifiable.

423.14 Special safety requirements.

423.14.1 Master control switch. In addition to the regular main supply cut-off, each laboratory type space (such as biology, industrial, chemistry, physics, home economics, and electronics labs) equipped with unprotected gas cocks, compressed air valves, water or electric services which are easily accessible to students, shall have master control valves or switches with permanently attached handles, located and accessible within 15 feet (4572 mm) of the instructor's station or adjacent to the door within that space to allow for emergency cut-off of services. The cut-offs shall be in a nonlockable place and the location and operation shall be clearly labeled. Valves shall completely shut off with a one-quarter turn. Computer labs are exempted from this requirement. (Also, see "Emergency shut off switches," and "Emergency disconnects" requirements under "Electrical.")

423.14.2 Interior signage. Signage is required in educational and ancillary facilities. Design, construction, installation, and location of interior signage and graphics shall comply with the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal and the following:

423.14.2.1 Emergency rescue windows: Windows for emergency rescue shall comply with NFPA 101, Florida Edition, as adopted by the *Florida Fire Prevention Code*, shall be operable from the inside by a single operation, and shall be labeled "EMERGENCY RESCUE—KEEP AREA CLEAR."

423.14.2.2 Maximum capacity signs in each space with a capacity of 50 or more occupants. The signs shall be mounted adjacent to the main entrance door.

423.14.2.3 Room name, room number and, if different, FISH inventory numbers shall be provided for each space.

423.14.2.4 A graphic diagram of primary and emergency evacuation routes shall be posted adjacent to the primary exit door from each space occupied by six or more students. The diagram shall clearly indicate, by contrasting color and number, each route of evacuation.

423.14.2.5 Signs necessary to meet accessibility requirements shall be provided.

423.14.2.6 Hazardous work and storage areas shall be identified by appropriate caution signs.

423.14.3 Other potential hazards. Pipes, ductwork, fans, light fixtures, window projections, protruding sharp corners, or other potential hazards shall not be installed below 6 feet 8

inches (2031 mm) AFF. Audio/visual aids in classrooms may be mounted below 6 feet 8 inches (2031 mm) provided they are marked and padded in accordance with accepted safety standards or have permanent cabinets installed below them.

423.14.4 Storage shelving. Shelving shall not have sharp corners, splinters, or any construction feature that would be hazardous to the occupants. Shelving shall be constructed to carry the loads imposed. Shelving in science, labs, and shop storage rooms, and other places which may contain hazardous materials shall have a $\frac{1}{2}$ inch (12.7 mm) lip on the front edge of each shelf and shall be constructed of noncorrosive material.

423.14.5 Vertical platform lifts and inclined wheelchair lifts. The following standards are in addition to the other requirements of the *Florida Building Code*, Florida law, and federal requirements:

423.14.5.1 Lifts shall not reduce the width of required means of egress.

423.14.5.2 Lifts shall have shielding devices to protect users from the machinery or other hazards and obstructions.

423.14.5.3 Lifts shall be key operated for attendant operation in all facilities housing kindergarten to grade 8.

423.14.5.4 Inclined wheelchair lifts may be installed in facilities provided:

423.14.5.4.1 The platform is equipped with bidirectional ramp sensing to stop travel if obstructions are encountered.

423.14.5.4.2 Guide rails are smooth and continuous with no sharp edges or obstructions, all drive system components contain safety features for protection of users, and cables and pulling devices are shielded.

423.14.6 Color code machinery. Working machinery with component parts shall be color-coded per ANSI Z53.1, *American National Standard Safety Color Code for marking Physical Hazards*. Safety zone lines shall be marked on the floor areas surrounding working machinery.

423.14.7 Anchor equipment. All equipment designed to be permanently mounted shall be securely anchored to its supporting surface.

423.14.8 Interior finishes.

423.14.8.1 Floors. Floors in instructional spaces shall be covered with resilient material or carpet. Floors in gymnasium locker rooms, showers, drying areas, toilet rooms, kitchens, scullerys, food storage areas and can wash areas shall be impervious.

423.14.8.2 Walls. Walls in toilet rooms shall be impervious to a height of at least 4 feet (1219 mm) above the floor. Walls in kitchens, scullerys, can wash areas, shower rooms shall be impervious to a height of at least 6 feet (1829 mm) above the floor. Toilet and shower partitions shall be impervious.

423.14.8.3 Ceilings. Ceilings in group toilet rooms, kitchens, scullerys, can wash areas, showers and locker rooms shall be impervious.

423.15 Mechanical.

423.15.1 Gas and fluid piping.

423.15.1.1 Flammable liquids/gases. Piping systems for flammable liquids or gases shall not be installed in interior corridors or stairwells.

Exception: Piping may be located within corridors provided that they are enclosed in a minimum 1-hour fire-rated enclosure.

423.15.1.2 Piping systems. Piping (fluid system) shall not be run where students can access the pipes, or in areas such as on roofs where they can be damaged by routine or periodic maintenance activities.

423.15.1.3 Main supply valve. The main supply cut-offs for flammable liquids or gases shall shut down upon activation of the fire alarm system. Refer to the automatic shutoff requirements of Section 423.7.6.

423.15.2 Air plenums. Corridors shall not be used as a supply, return, exhaust, relief, or ventilation air plenum. The space between the corridor ceiling and the floor or roof structure above, if used as a plenum, shall be constructed with the ceiling, floor and walls as a minimum 1-hour fire-rated assembly or as a 1-hour fire-rated horizontal wall supported by the corridor walls.

Exception: A smoke-tight corridor with a solid ceiling may be used in a fully sprinklered building.

423.15.3 Residential equipment. In home economics instructional spaces, faculty lounges, and similar areas where small residential-type ranges are installed for staff use or student education, residential-type hoods mechanically exhausted to the outside shall be used. Hood fire suppression systems are not required to be installed.

423.15.4 Toilet rooms shall be continuously ventilated during building occupancy.

Exception: Individual toilet rooms shall be ventilated continuously during building occupancy or ventilation shall turn off with the light switch and run for at least 10 minutes after the light has been turned off.

423.15.5 Chemistry laboratories and science classrooms. HVAC systems in chemistry labs and science classrooms shall be designed and installed to ensure that chemicals originating from the space are not recirculated.

Exception: A high capacity emergency exhaust system providing twenty (20) air changes per hour may be used in chemistry laboratories and science classrooms with fume hoods. Positive ventilation may be provided via doors or windows opening to the exterior. Signs providing operational instructions shall be permanently installed at the emergency exhaust system fan switch and adjacent to the door(s) or window(s) to be opened.

423.15.6 Ventilation air make-up for HVAC systems. Where peak occupancies of less than 3 hours duration occur, the outdoor air flow may be determined on the basis of average occupancy for school buildings for the duration of operation of the air-conditioning system, provided the average occupancy used is not less than one-half the maximum.

423.16 Plumbing.

423.16.1 Standards. Educational and ancillary facilities shall be provided with toilets, hand washing facilities, and drinking fountains for all occupants, in ratios and accessible as required by the *Florida Building Code*, Florida law, and federal requirements.

Exception: A single unisex toilet room is allowed where provided in child care, pre-kindergarten through grade 3 and ESE classrooms. Unisex toilets shall not be provided in addition to group toilets in assembly occupancies.

423.16.1.1 Assembly occupancies. Toilet facilities for assembly occupancies (i.e. media centers, gymnasiums, cafeteriums, and auditoriums) are not required to be in addition to the overall required plumbing fixture count.

423.16.1.2 Location. Student toilets shall be distributed throughout the facility and located on each floor for convenient access and continuous supervision. The path of travel to the nearest toilet facility shall not exceed a distance of 200 feet.

423.16.2 Teacher toilets. In school board facilities, faculty and staff toilets shall be separate from student toilets.

Exception: Separation of faculty/staff and student toilet facilities is not required for community colleges.

423.16.3 Public shelter. Refer to the public shelter design criteria of Section 423.25.

423.16.4 Urinals. Trough urinals shall not be installed in any location.

423.16.5 Floor drains and hose bibbs. All group toilet rooms shall be provided with at least one floor drain and one easily accessible hose bibb. The floor shall be sloped down to the drain. Stall urinals shall not serve as the required floor drains.

423.16.6 Shielding device. The entry to each group toilet room shall be provided with a door, partition, or other shielding device to block from view the occupants in the toilet room. If a door is provided, it shall have a closer and shall swing out in the direction of exit. Exterior entries to toilet rooms shall have outward swinging doors.

423.16.7 Hot water. When hot water is supplied to showers, handwash sinks, lavatories in toilet rooms, a mixing valve shall be installed to control the temperature which shall not exceed 110°F (43°C).

423.16.8 Delayed closing valves. Water supply at toilet room lavatories shall be controlled by delayed-closing valves.

423.16.9 Shower facilities. Showers shall be provided only where required by the district's educational program and, where provided, shall utilize energy saving concepts for hot water as required by Section 1013.44(2), *Florida Statutes*. When provided, shower areas shall comply with the following:

423.16.9.1 Floor finish shall be slip resistant.

423.16.9.2 Floors shall be drained in such a manner that waste water from any shower head will not pass over areas occupied by other bathers.

423.16.9.3 Water shall be heated and the temperature at the shower head shall not exceed 110°F (43°C) nor be less than 95°F (35°C).

423.16.9.4 A master control valve shall be provided to control the shower heads. Showers shall be equipped with flow control devices to limit total flow to a maximum of 3 gpm (-19 L/s) per shower head.

423.16.9.5 Shower heads shall be based on the peak load to be accommodated at one time and provided at the ratio of one shower head for each five students, located a minimum of 30 inches (762 mm) apart.

423.16.10 Kitchens. Kitchens and food service areas shall be provided with toilet and hand washing facilities for employees as required by code, state rule and statute.

423.16.10.1 Toilet rooms shall be completely enclosed, have self-closing doors, and shall open into vestibules with self-closing doors. Toilet rooms shall not open directly into food preparation areas, serving areas, or dining areas. A minimum of one water closet and one lavatory, with hot and cold water, shall be provided in each staff toilet.

423.16.10.2 Floor drains. Floor drains shall be provided in the food serving area, kitchen area, scullery, garbage and rubbish rooms, and can wash area.

423.16.11 Dousing shower and eye wash. Every science room, lab, or shop where instructors and students handle materials or chemicals potentially dangerous to human tissue shall be provided with a dousing shower and eye wash for emergency use, including a floor drain.

423.16.12 Floor drains and plumbing fixtures in equipment rooms. No floor drain or other plumbing fixture shall be installed in a room containing air handling machinery when such room is used as a plenum. When rooms are used as a plenum, equipment drains shall be conveyed through an indirect waste receptor located outside such rooms or other approved point of disposal.

423.17 Electrical.

423.17.1 Emergency lighting. Emergency lighting shall be provided at internal and external means of egress, in student-occupied areas, in group toilets, and main electrical rooms.

423.17.2 Electrical rooms and closets. Main service panels and switches, electrical distribution panels, cabinets, and rooms shall be lockable and not readily accessible to teachers or students.

423.17.3 Spare capacity. Lighting and power panels shall be provided with a minimum of 20-percent spare breakers and a minimum of 10-percent spare capacity in all main panels and switchboards.

423.17.4 Emergency shutoff switches. Every laboratory space which has electrical receptacles at student workstations shall have an emergency shutoff switch within 15 feet (4572 mm) of the instructor's workstation. The emergency shut off switch shall be operable by a single motion and shall interrupt power to all receptacles in the room.

Exception: Emergency shutoff switches are not required in computer laboratories.

423.17.5 Emergency disconnect. Each space equipped with electrically powered machinery accessible to students shall have a minimum of two master emergency disconnect switches at convenient locations within the space to shutoff all power tool outlets, power to student accessible machines and receptacles in the shop. One emergency shutoff or disconnect switch shall be located near the machinery and one emergency shutoff or disconnect switch shall be located in the instructor's office if there is a clear view of the entire shop area, others may be required and located as determined by the authority having jurisdiction. The emergency disconnect or shutoff switch shall be operable by a single motion.

Exception: Ordinary office machines, computers, sewing machines, potter's wheels, residential cooking equipment in home economics labs and other nonhazardous machines do not require emergency disconnect devices.

423.17.6 Sauna and steam rooms. A "panic" switch to deactivate power to heating equipment shall be provided inside sauna and steam rooms. The panic switch shall also be tied into an alarm or other approved warning device in a supervised space in the area of the sauna and/or steam room. The operation of the switch shall be labeled to indicate the intended function.

423.17.7 Lightning. All facilities in high lightning risk areas shall be evaluated using the *Risk Assessment Guide* in NFPA 780 and other standards which address lightning protection, and shall be protected accordingly.

423.17.8 Ground fault interrupter (GFI) receptacles. GFI receptacles shall be installed as required by NFPA 70 of Chapter 27 and in the following locations:

1. All elementary special needs classroom receptacles.
2. All building entry vestibule receptacles.
3. All mechanical, boiler and electrical rooms receptacles.

423.18 Assembly occupancies in public educational facilities.

423.18.1 Occupant capacity of an assembly occupancy shall be calculated as follows:

423.18.1.1 Auditorium. The number of fixed seats, including accessible seating, in the main seating area plus the stage at 15 net square feet (1.4 m²) per person, plus dressing rooms at 20 net square feet (2 m²) per person.

423.18.1.2 Gymnasium/gymnasium with stage. The number of fixed and telescopic bench-type bleacher seats at 18 linear inches (457 mm) per person, including accessible seating, plus the main court area at 15 gross square feet (1.4 m²) per person, plus locker rooms at 5 net square feet (.5 m²) per person, plus stage at 15 net square feet (1.4 m²) per person, plus dressing rooms at 20 net square feet (2 m²) per person. Bleachers shall be accessible as required.

423.18.1.3 Dining rooms/cafetorium with stage/multipurpose room. The main floor area at 15 gross square

feet (1.4 m²) per person, plus the stage at 15 net square feet (1.4 m²) per person, plus dressing rooms at 20 net square feet (2 m²) per person, plus the kitchen at 100 gross square feet (9 m²) per person.

423.18.1.4 Classrooms and labs. Exiting capacity for classrooms shall be calculated at 20 net square (2 m²) feet per occupant. Exiting capacity for laboratories shall be calculated at 50 net square feet (5 m²) per occupant. If spaces are combined through the use of folding partitions, the capacity and exiting shall be based on the capacity of all the spaces joined.

423.18.1.5 Stadiums. The number of fixed bench-type bleacher seats at 18 linear inches (457 mm) per person, plus accessible seating.

423.18.1.6 Media centers. The reading room and stacks floor area at 36 net square feet (3.3 m²) per person, plus small group room or area (view and preview) at 5 net square feet (.5 m²) per person.

423.18.1.7 Closed circuit television production, distribution, and control. The main floor area at 15 net square feet (1.4 m²) per person.

423.18.1.8 Interior courtyards. The interior courtyard area at 15 gross square feet (1.4 m²) per person. Raised, dedicated landscape areas may be deducted.

423.19 Shade and green houses.

423.19.1 General. Shade/green houses shall be of Type I or II construction (metal frame) capable of withstanding the appropriate wind load.

423.19.2 Unrestricted exiting. The location of the shade/green house shall not hinder exiting from new and/or existing structures.

423.19.3 Required doors. A minimum of two doors remotely located shall be provided. Doors shall be side hinged and shall swing in the direction of egress.

423.19.4 Accessibility. Green houses shall meet accessibility requirements. The accessible walkway shall be connected to doors leading to an accessible route to the permanent structure.

423.19.5 Shade cloth. Shade cloth shall be tear-away fabric securely fastened to the structural frame.

423.19.6 Fire extinguisher. A minimum of one Type 2A-10B:C fire extinguisher shall be provided per shade/green house.

423.19.7 Fire alarm. Fire alarm pull stations shall be located within 200 feet (60 960 mm) of any shade or green house. Fire alarm horns mounted on a permanent building must be audible inside the shade/green house.

423.19.8 Space heaters. Space heaters, when provided, shall be mounted at least 6 feet 8 inches (2031 mm) AFF.

423.20 Storage.

423.20.1 General storage. Storage rooms and closets shall not be located over or under exit stairs and ramps whether interior or exterior. General storage space(s) shall be included in every educational facility for the bulk storage of

materials, supplies, equipment, and books. Storage rooms shall be separated from mechanical and electrical spaces. Storage spaces shall be mechanically ventilated and conditioned as appropriate for the type of materials to be stored. Sinks located in general storage rooms shall not be used for custodial services.

423.20.2 Custodial work areas and storage. Provide custodial work areas with well supported shelving for supplies, cleaning, and sanitation materials and an office area including male/female lockers and toilet facilities.

423.20.3 Custodial closets and storage. Custodial closets shall be provided with storage shelving and a service sink supplied with both hot and cold water. They shall be located to serve each instructional floor and wing regardless of floor area, and other areas such as stage, kitchen, gym, auditorium, clinic, offices and shops. The travel distance to the nearest custodial closet shall not exceed 150 feet.

423.20.4 Chemical and hazardous materials storage. In addition to the requirements of the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal for separation and protection, chemical and hazardous storage facilities shall also include:

423.20.4.1 Chemical storage. Rooms used for the storage, handling, and disposal of chemicals used in school and community college laboratories shall be vented to the exterior. The ventilation system shall not be connected to the air-conditioning return air system, and the rooms shall be kept at moderate temperatures. Doors shall be lockable from the outside and operable at all times from the inside. Rooms shall be well illuminated. Cabinets shall have shelves with a 1/2 inch (12.7 mm) lip on the front and shall be constructed of noncorrosive material. When vented to the exterior, chemical storage cabinets shall be mechanically vented in accordance with NFPA 30 and NFPA 91.

423.20.4.2 Hazardous materials storage. Buildings and/or rooms used for the storage, handling and disposal of flammable, poisonous, or hazardous materials or liquids, and equipment powered by internal combustion engines and their fuels shall be separated from adjacent spaces by 1-hour fire-rated assemblies. These requirements also apply to completely detached buildings within 60 feet (18 288 mm) of student-occupied facilities. Doors shall have a C Label and open directly to the exterior. Storage buildings and/or rooms shall be mechanically ventilated. Electrical fixtures, switches, heat detectors and outlets installed in flammable storage rooms shall be explosionproof.

423.21 Child care/day care/prekindergarten facilities.

423.21.1 Child care/day care/prekindergarten facilities located on board-owned property shall comply with *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal and the specific criteria in this section. Child care/day care/pre-kindergarten facilities requiring a license from another agency may also be required to comply with additional construction requirements imposed by that agency.

423.21.2 Toilet facilities shall meet accessibility requirements and should open into the instructional space. The toilet may be used by both sexes and shall contain a water closet, lavatory and related accessories.

423.21.3 If child care facilities are provided with a bathing area, it shall be within or adjacent to the child care area and shall contain either a shower with hand-held sprayer or a tub. The water temperature shall be controlled by a mixing valve and shall not exceed 110°F (43°C).

423.21.4 Toilet facilities shall have a non-slip impervious floor and 6-foot (1829 mm) impervious wainscot.

423.21.5 Drinking fountain(s) shall be provided for the children and be within close proximity of the child care facility.

423.21.6 A towel and soap dispenser shall be provided at each sink. Hand wash areas for adults shall be provided with warm water; the water temperature shall be controlled by a mixing valve and shall not exceed 110°F (43°C). All electrical receptacles shall be placed out of reach of the children.

423.21.7 When provided, a residential-type kitchen shall include a nonslip floor, a refrigerator, a residential range, a residential-type range hood mechanically exhausted to the outside, and a fire extinguisher located within 15 feet (457 mm) of the range within the same room.

423.21.8 Areas designated for children's sleeping mats, cots or cribs shall include a clearly marked exit passageway.

423.21.9 The child care facility shall not contain any storage of cleaning agents, chemicals, or other hazardous materials in student accessible areas.

423.21.10 Outdoor play areas shall be provided and shall be protected from access to streets or other dangers. The play area shall be fenced or walled to a minimum height of 4 feet (1219 mm) and any latches on maintenance gates shall be secured or beyond the reach of the children.

423.21.11 Shade shall be provided in the play area (a covered play area may be provided).

423.21.12 Play equipment shall be firmly anchored, free of sharp corners or pointed surfaces, and shall have cushioning surfaces such as mats or sand beneath.

423.21.13 The grounds shall be free of undergrowth or harmful plant material.

423.22 Clinics.

423.22.1 Clinics in kindergarten through grade 12 (K-12), vocational-technical centers (VTC), and full service schools shall comply with the general criteria found in the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal, as well as the specific criteria found herein. Clinics shall be located and equipped to provide emergency aid to students. Closets and storage cabinets used for medications and bandages shall have locks, and shall be designed to be under constant supervision.

423.22.2 School clinics shall include locked storage, toilet room and shower, and bed space.

423.22.3 Sanitary facilities are required as follows:

423.22.3.1 Elementary school clinics, including kindergarten, shall include at a minimum one accessible toilet room, to serve male and female students, complete with a water closet, lavatory, accessible shower, changing table, and accessories.

423.22.3.2 Secondary and VTC school clinics shall include two accessible toilet rooms complete with water closet, lavatory, accessories and shower.

423.22.3.3 Toilet rooms in clinics shall include both hot and cold water at the showers and all lavatories. The water temperature shall be controlled by a mixing valve and shall not exceed 110°F (43°C).

423.22.3.4 Toilet rooms shall have exhaust fans vented to the exterior.

423.22.3.5 A working counter top with lavatory/sink and hot water shall be provided in each clinic.

423.22.4 The bed area shall be designed to maintain constant visual supervision from the office. Space for student beds shall be provided in each clinic at 50 square feet (5 m²) per bed. Space for beds in secondary and VTC schools shall be equally divided for male and female students. Beds shall be provided based on student capacity in the following ratios:

423.22.4.1 Up to 500 students—three beds.

423.22.4.2 501 to 1,000 students—four beds.

423.22.4.3 1,001 to 2,000 students—five beds.

423.22.4.4 Over 2,000—six beds.

423.22.5 Full-service school health clinics.

423.22.5.1 Location. Clinics shall be located to provide a direct accessible route from the exterior and from the interior or by a connecting covered walk.

423.22.5.2 Parking. Clinics shall be provided with 10 designated parking spaces immediately adjacent to the clinic, one of which shall be accessible to persons with disabilities.

423.22.5.3 Sanitary facilities. Sanitary facilities are required as follows:

423.22.5.3.1 Full-service school clinics shall include one accessible toilet room for males and one for females, complete with water closet, lavatory, accessories, and shower. Additional toilets may be required for a full-service school clinic depending on occupant load and program.

423.22.5.3.2 Hot and cold water shall be provided at the showers and lavatories. The water temperature shall be controlled by a mixing valve and shall not exceed 110°F (43°C).

423.22.5.3.3 Toilet rooms shall have exhaust fans vented to the exterior.

423.22.5.3.4 A nurses' station shall be provided with a working counter with lavatory/sink and be located so as to maintain visual supervision of the bed area.

423.22.5.4 Locked storage rooms shall be provided for a refrigerator, files, equipment, and supplies.

423.22.5.5 Data outlets shall be provided for computer hook-ups and computer networking and additional electric outlets shall be provided for hearing and vision testing machines.

423.23 Kilns. Kiln rooms and areas shall be provided with adequate exhaust to dispel emitted heat to the exterior, and they shall not be connected to any other exhaust system. Kilns shall not be located near or adjacent to paths of egress or exit and shall be placed in separate rooms when serving students through grade 3. Kiln rooms shall be provided with appropriate smoke/heat detectors connected to the fire alarm system.

423.24 Open plan schools. An open plan building or portion of a building may be subdivided into smaller areas by use of low partitions [maximum 5 feet high (1524 mm)], movable partitions, or movable furnishing, which by location and type do not hinder or obstruct the ability of persons in one area of the plan to be immediately aware of an emergency condition in any other area of the plan. Corridors shall be identified with different color or type of flooring materials, by permanent low partitions or by other means to prevent blockage of the path of egress to exits by partitions or furniture. When open plan schools are partitioned, the work shall conform to the code requirements for new construction. Demountable or movable partitions in open plan classroom areas shall be a maximum of 5 feet (1524 mm) in height and shall terminate a minimum of 5 feet (1524 mm) from any permanent wall. All circulation openings in open plan areas shall be a minimum of 5 feet (1524 mm) wide. Movable furnishings shall not exceed 5 feet (1524 mm) in height and shall have a stable base.

423.25 Public shelter design criteria.

423.25.1 New facilities. New educational facilities for school boards and community college boards, unless specifically exempted by the board with the written concurrence of the applicable local emergency management agency or the Department of Community Affairs (DCA), shall have appropriate areas designed as enhanced hurricane protection areas (EHPAs) in compliance with this section.

Exception: Facilities located, or proposed to be located, in a Category 1, 2, or 3 evacuation zone shall not be subject to these requirements.

423.25.1.1 Enhanced hurricane protection areas (EHPA). The EHPA areas shall provide emergency shelter and protection for people for a period of up to 8 hours during a hurricane.

423.25.1.1.1 The EHPA criteria apply only to the specific portions of (K-12) and community college educational facilities that are designated as EHPAs.

423.25.1.2 The EHPAs and related spaces shall serve the primary educational or auxiliary use during non-shelter occupancy.

423.25.2 Site. Factors such as low evacuation demand, size, location, accessibility and storm surge may be considered by the board, with written concurrence of the local emer-

gency management agency or the DCA, in exempting a particular facility.

423.25.2.1 Emergency access. EHPAs shall have at least one route for emergency vehicle access. The emergency route shall be above the 100-year floodplain. This requirement may be waived by the board, with concurrence of the local emergency management agency or the DCA.

423.25.2.2 Landscaping. Landscaping around the EHPAs shall be designed to preserve safety and emergency access. Trees shall not conflict with the functioning of overhead or underground utility lines, or cause laydown or impact hazard to the building envelope.

423.25.2.3 Parking. During an emergency condition, vehicle parking shall be prohibited within 50 feet (15240 mm) of an EHPA. Designated EHPA parking areas may be unpaved.

423.25.2.4 Signage. Floor plans of the facility, indicating EHPAs, shall be mounted in the emergency manager's office/area.

423.25.3 Design. EHPAs may be above or below ground and may have more than one story, provided the design satisfies the wind load and missile impact criteria. Modular and open-plan buildings may serve as EHPAs provided the design satisfies the wind load and missile impact criteria.

423.25.3.1 Excluded spaces. Spaces such as mechanical and electrical rooms, storage rooms, open corridors, kitchens, science rooms and labs, vocational shop areas and labs, computer rooms, attic and crawl spaces shall not be used as EHPAs.

423.25.3.2 Capacity. Fifty percent of the net square feet of a designated educational facility shall be constructed as EHPAs. The net square feet shall be determined by subtracting from the gross square feet those spaces, such as mechanical and electrical rooms, storage rooms, open corridors, kitchens, science rooms and labs, vocational shop areas and labs, computer rooms, attic and crawl spaces that shall not be used as EHPAs. The board, with concurrence of the applicable local emergency management agency or DCA, may adjust this requirement if it is determined to be in its best interest. The capacity of an EHPA shall be calculated at 20 square feet (2 m²) per occupant (adults and children five years or older).

423.25.3.3 Toilets. Toilet and hand washing facilities should be located within the EHPAs and provided at one toilet and one sink per 40 occupants. These required toilet and hand-washing facilities are not in addition to those required for normal school occupancy and shall be included in the overall facility fixture count.

423.25.3.3.1 Support systems for the toilets, e.g., bladders, portable toilets, water storage tanks, etc., shall be capable of supplying water and containing waste, for the designed capacity of the EHPAs.

423.25.3.3.2 Plumbing and valve systems of "normal" toilets within the EHPAs may be designed for

conversion to emergency operation to meet the required demand.

423.25.3.4 Food service. Where feasible, include counter tops for food distribution functions in the EHPAs.

423.25.3.5 Manager's office. An administration office normally used by a school administrator shall be identified as the EHPA manager's office and shall be located within the EHPA. The office shall have provisions for standby power, lighting, communications, main fire alarm control panel and storage for the manager's equipment.

423.25.4 Structural standard for wind loads. At a minimum, EHPAs shall be designed for wind loads in accordance with ASCE 7, *Minimum Design Loads for Buildings and Other Structures, Category III (Essential Buildings)*. Openings shall withstand the impact of wind-borne debris missiles in accordance with the impact and cyclic loading criteria per SBC/SSTD 12. Based on a research document, *Emergency Shelter Design Criteria for Educational Facilities*, by the University of Florida for the DOE, it is highly recommended by the department that the shelter be designed using the map wind speed plus 40 mph, with an importance factor of 1.0.

423.25.4.1 Missile impact criteria. The building enclosure, including walls, roofs, glazed openings, louvers and doors, shall not be perforated or penetrated by a flying object. For walls and roofs, the missile criteria is as provided in SBC/SSTD 12.

423.25.4.1.1 Materials used for walls, roofs, windows, louvers, and doors shall be certified for resistance to missile impact criteria.

423.25.4.1.2 The glazed openings or permanent protective systems over glazed openings shall be designed for cyclic loading.

423.25.4.2 Roofs. Roof decks shall be cast-in-place 4-inch (102 mm) or more, normal weight concrete. Concrete decks shall be waterproof. Systems other than cast-in-place concrete shall have adequate bearing, anchorage against wind uplift, diaphragm action, and resistance to rain that are equivalent to a cast-in-place system.

Exception: Structural precast concrete roofs, composite metal decks with normal weight concrete roofs, or other systems and materials that meet the wind load and missile impact criteria may be used.

423.25.4.2.1 Light weight concrete or insulating concrete may be used on roof decks of EHPAs provided the roof decks are at least 4-inch (102 mm) cast-in-place normal weight concrete or other structural systems of equivalent strength.

423.25.4.2.2 Roof openings (e.g., HVAC fans, ducts, skylights) shall be designed to meet the wind load and missile impact criteria.

423.25.4.2.3 Roof coverings shall be specified and designed according to the latest ASTM and Factory Mutual Standards for materials and wind uplift forces.

Roofs shall be inspected by a licensed engineer/architect and a representative of the roofing manufacturer.

423.25.4.2.4 Roofs shall have adequate slope and drains sized for normal use and shall have emergency overflow scuppers which will accommodate a 2-inch-per-hour (51 mm) rain for 6 hours.

423.25.4.2.5 Parapets shall satisfy the wind load and missile impact criteria; roof overhangs shall resist uplift forces.

423.25.4.3 Windows. All unprotected window assemblies and their anchoring systems shall be designed and installed to meet the wind load and missile impact criteria.

423.25.4.3.1 Windows may be provided with permanent protective systems, provided the protective system is designed and installed to meet the wind load and missile impact criteria and completely covers the window assembly and anchoring system.

423.25.4.3.2 EHPAs shall have mechanical ventilation systems. Ventilation shall be provided at a minimum rate of 2 cfm per square foot of EHPA floor area. The mechanical ventilation system shall be connected to the EHPA's emergency power.

423.25.4.4 Doors. All exterior and interior doors subject to possible wind exposure and/or missile impact shall have doors, frames, anchoring devices, and vision panels designed and installed to resist the wind load and missile impact criteria or such doors, frames, anchoring devices, and vision panels shall be covered with permanent protective systems designed and installed to resist the wind load and missile impact criteria.

423.25.4.5 Exterior envelope. The exterior envelope, louvers over air intakes and vents, and gooseneck type intakes and vents of EHPAs shall be designed and installed to meet the wind load and missile impact criteria.

423.25.4.5.1 HVAC equipment mounted on roofs and anchoring systems shall be designed and installed to meet the wind load criteria.

423.25.4.5.2 Roof mounted HVAC equipment shall have a 12-inch-high (305 mm) curb around the roof opening and be designed to prevent the entry of rain water.

423.25.4.6 Foundations and floor slabs. Foundations shall be designed to resist all appropriate loads and load combinations, including overturning moments due to wind. The floor elevation and necessary life safety and other emergency support systems of EHPAs shall be elevated above the maximum storm surge inundation elevation associated with a Category 4 hurricane event. Storm surge elevations shall be identified by the most current edition of the regional Sea Lake and Overland Surges from Hurricanes (SLOSH) studies and atlases.

423.25.5 Electrical and standby emergency power system. The EHPA shall be provided with a standby emergency electrical power system, per Chapter 27, NFPA 70 Articles 700 and 701, which shall have the capability of being connected to a backup generator or other optional power source. Where economically feasible, an equivalent photovoltaic system may be provided. The EHPA's emergency systems

includes, but are not limited to: (1) an emergency lighting system, (2) illuminated exit signs, (3) fire protection system(s), alarm (campus wide) and sprinkler, and (4) minimum ventilation for health/safety purposes. The fire alarm panel shall be located in the EHPA manager's office. A remote annunciator panel shall be located in or adjacent to the school administrator's office. When generators are installed, the facility housing the generator, permanent or portable, shall be an enclosed area designed to protect the generators from wind and missile impact. Air intakes and exhausts shall be designed and installed to meet the wind load and missile impact criteria. Generators hardened by the manufacturer to withstand the area's design wind and missile impact criteria shall be exempt from the enclosed area criteria requirement.

423.25.5.1 EHPA lighting. Emergency lighting shall be provided within the EHPA area, EHPA manager's office, toilet rooms, main electrical room and generator spaces and shall be at least 10 footcandles (100 lux) of general illumination, which can be reduced to $\frac{1}{2}$ footcandle (5 lux) in the sleeping areas during the night.

423.25.5.2 Optional standby circuits. Additional nonlife safety systems, as defined by Chapter 27, NFPA 70 Article 702 (optional standby circuits), may be supplied power, if available, by the Standby Emergency Power System. These systems shall be connected to the Standby Emergency Power System via an electrical subpanel to the Standby Electrical Power System's main electrical panel. This will allow selective or total load shedding of power if required. The fire alarm, emergency lighting and illuminated exit signs throughout the entire campus shall receive first priority to power provided by the Standby Emergency Power System per Chapter 27, NFPA 70 Article 700. The systems listed are not all encompassing but are in order of priority. Local officials may request additional non-life safety systems they deem necessary for health, welfare and safety of the public during occupancy:

1. Remainder of the school's campus security lighting (building and site).
2. Additional ventilation systems within the EHPA, including heat.
3. Intercom system.
4. Food storage equipment.
5. Additional electric receptacles, other than those required by Section 423.25.5.3.

423.25.5.3 Receptacle outlets. A minimum of four electrical outlets, served with power from the standby circuits, shall be provided in the EHPA manager's office.

423.25.6 Inspections. EHPAs shall be considered "threshold buildings" in accordance with Section 553.71(7), *Florida Statutes*, and shall comply with Sections 553.79(5), 553.79(7), and 553.79(8), *Florida Statutes*.

423.25.6.1 Construction of EHPAs shall be inspected during the construction process by certified building code inspectors or the design architect/engineer(s) certified pursuant to Part XII Chapter 468, *Florida Statutes*

and threshold inspectors for compliance with applicable rules and laws.

423.25.6.2 The emergency electrical systems shall be inspected during the construction process by certified electrical inspector or Florida-registered professional engineers certified pursuant to Part XII Chapter 468, *Florida Statutes*, skilled in electrical design.

423.25.6.3 EHPAs shall be inspected and recertified for compliance with the structural requirements of this section every five years by a Florida-registered professional engineer skilled in structural design. If any structural system, as specified in this section, is damaged or replaced, the recertification shall be obtained prior to the beginning of the next hurricane season.

423.25.6.4 All shutter systems, roofs, overflow scuppers, and structural systems of EHPAs shall be inspected and maintained annually prior to hurricane season and after a major event. All emergency generators shall be inspected under load conditions including activation of the fire alarms, emergency lights as per applicable equipment codes and NFPA standards, and including mechanical systems and receptacles connected to the emergency power.

423.26 Time-out rooms.

423.26.1 Locking an individual inside a space without a means of opening the door from within that space is contrary to the exiting philosophy of the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal for educational facilities. The educational program which requires containment of the out-of-control student can be accommodated within this context only if the following are met:

423.26.2 Electromagnetic locking device. When a time-out room is to be locked, an electromagnetic locking device may be used and shall have the following features:

423.26.2.1 The lock shall remain engaged only when a push button mounted outside the time-out room adjacent to the door frame, or other hand held device, is continuously depressed by hand. Upon release of pressure, the door shall unlock. The locking device shall be designed so that it cannot be engaged by leverage of an inanimate object or in any other manner except by constant human contact.

423.26.2.2 The push button, or similar device, shall be recessed from the face of the unit housing, or in some other way designed to prevent taping or wedging the button in the engaged mode.

423.26.2.3 The device shall have an interface relay with the fire alarm system and shall automatically release upon activation of the fire alarm.

423.26.2.4 The locking device shall automatically disengage in the event of a power failure.

423.26.2.5 Timers shall not be used on the locking device.

423.26.3 Door requirements. The door shall have only a push plate exposed on the interior of the room.

423.26.3.1 The door shall swing out of the room and shall be equipped with a fully concealed track type closer.

423.26.3.2 A vision panel shall be provided in the door, and it shall be no larger than 144 square inches (.1 m²). The view panel shall consist of a clear 1/4-inch-thick (6 mm) unbreakable plastic panel flush with the inside face of the door on the inside of the room. The panel shall be positioned in the door so that a staff member may continuously keep the student under surveillance.

423.26.3.3 The door frame and jamb/head reveal on the inside shall be minimal. If provided, a flat metal threshold shall be used.

423.26.4 Finishes. The floor and walls shall be durable, vandal-resistant materials. The ceiling shall be of a solid and moisture-resistant material. There shall be no projections or protrusions from the walls, ceiling, or floor. All surfaces shall be smooth and no electrical outlets, switches, plumbing clean-outs or similar items shall be inside the room. The room shall not contain anything that can be set on fire, torn, shredded or otherwise used for self-harm.

423.26.5 Minimum size. The room shall be designed for a single occupant only and shall be a minimum of 6 feet by 6 feet (1828 mm by 1828 mm).

423.26.6 Lighting. The room shall have a recessed vandalproof light fixture in the ceiling capable of being dimmed. The light switch shall be located outside the room adjacent to the door jamb.

423.26.7 HVAC required. Time-out rooms shall be mechanically heated and cooled. Registers shall be ceiling mounted and vandalproof.

423.27 New relocatable buildings.

423.27.1 Relocatables. The terms “relocatable” and “portable” are interchangeable and both terms are used to describe buildings which are constructed to the same building codes as permanent public school buildings, except they are designed to be moved. These buildings may be manufactured in a plant, constructed on site, may be made of demountable components, and may be combined. All new relocatable or portable classrooms shall be designed and constructed in compliance with the *Florida Building Code*, the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal and the Department of Community Affairs rules for factory-built school buildings (see Section 428). The requirements for new relocatables contained herein are in addition to the minimum requirements of the *Florida Building Code* and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal. New relocatables which do not comply with the building codes, fire codes and these standards shall not be used as classrooms or for any other student occupancy. For code requirements and other standards applicable to relocatables constructed prior to this code, which may be Type V (wood) relocatables, see *Existing Relocatables, Volume 1, Section 5(2), State Requirements for Educational Facilities* as referenced in the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal.

423.27.1.1 Factory-built school shelter means any site-assembled or factory-built school building that is designed to be portable, relocatable, demountable or reconstructable and that complies with the provisions for enhanced hurricane protection areas, as required by the applicable code (see Section 423.25).

423.27.2 Design, plan approval, construction. Regardless of cost or fund source, whether used for classroom, auxiliary or ancillary space, whether leased, purchased, contracted, or constructed by the school board or community college board, plans and documents for relocatables, portables and modular schools shall be prepared by Florida registered design professionals and submitted to the authority having jurisdiction for review and approval for compliance with Florida laws, rules, building and life safety codes. The buildings shall be constructed and inspected by personnel licensed, certified or trained as required by Florida construction industry licensing laws.

423.27.2.1 District-wide foundation plans. District-wide foundation plans for tie down and wind resistance for each type of relocatable and each type of known soil condition in the district, shall be prepared and reviewed at the time of the design and shall be required as a part of the approval of any relocatable. These documents shall be kept on file in the district, with an additional copy in each relocatable filed together with current annual local fire inspection reports, as required by law. The foundation plans shall be reviewed and updated when necessary for compliance with current code for subsequent installations of the relocatable. Relocatables which do not meet the requirements of code for tie down and wind resistance shall not be occupied.

423.27.2.2 DOT Requirements. Relocatable units designed to be moved on state roads shall comply with the maximum unit height, length and width requirements of the DOT.

423.27.2.3 Inventory/construction date signage. A FISH inventory room number and the date of construction shall be noted on an inventory sign permanently affixed outside, beside or above the door, on all relocatables owned or leased by a district.

423.27.3 Construction type. All new relocatables constructed, purchased or otherwise acquired by a board shall be noncombustible Type I, II or IV construction.

423.27.4 Accessibility. All relocatables constructed, purchased or otherwise acquired by a board after the effective date of these standards shall comply with the Americans with Disabilities Act as modified by Chapter 553, *Florida Statutes*, Chapter 11 of the *Florida Building Code, Building*. Relocatables intended for use at facilities housing up to grades 5 or 6, shall also conform to the federal criteria *Accessibility Standards for Children’s Environments*, which is available from the U.S. Architectural and Transportation Barriers Compliance Board.

423.27.5 Site standards/site plan. Relocatables placed on educational plant sites shall comply with federal and state laws and rules relating to the placement of structures on sites, as well as building code, fire code site requirements.

423.27.5.1 Floodplain. Compliance with floodplain standards is required for the initial and subsequent installation of public educational relocatable units. The finished floor shall be 12 inches (305 mm) above base flood elevation, the structure shall be designed to meet the *Florida Building Code* and anchored to resist buoyant forces.

423.27.5.2 Covered walks and technology. New relocatables and “modular schools” acquired by a board which are intended for long term use, shall be connected from exit door to the core facilities by accessible covered walkways, and shall contain wiring and computer technologies which connect to the facility’s technology, communications and fire alarms infrastructure.

Exceptions:

1. Covered walks and public address systems are not required in community college facilities.
2. Temporary relocatables constructed after the date of this standard shall meet all construction requirements of this code, except that covered walks may be installed. The term “temporary relocatable” means relocatables which are used for less than three years to provide temporary housing while permanent replacement classrooms and related facilities are under construction, renovation or remodeling. The term “temporary relocatable” does not apply to relocatables which have been located on a school site for more than two years and used for classrooms or for student occupancy, where there is no identifiable permanent facility which is under construction, being remodeled, or renovated to house the students.

423.27.5.3 Separation of units. Type I, II or IV, (noncombustible) relocatable units shall be separated as required by the *Florida Building Code* and the school site plan.

423.27.6 Structure. Relocatable structures shall be positively anchored and designed to comply with *Florida Building Code* requirements.

423.27.7 Fire-retardant-treated wood (FRTW). Only FRTW which does not contain ammonium phosphates, sulfates, or halides may be used in the roof structure of Type II construction, as authorized by other sections of the *Florida Building Code*. FRTW shall comply with the specific requirements found elsewhere in these public educational facilities requirements. Contractors shall provide evidence of compliance to inspectors. Inspection access panels shall be provided to facilitate initial and annual inspections for general condition assessment of FRTW and connectors.

423.27.8 Doors. Exit doors shall swing in the direction of exit travel.

423.27.8.1 Classroom locksets. Each door shall be equipped with a lockset, which is readily opened from the side from which egress is to be made at all times, a threshold, heavy duty hinges, and closer to control door closing. Each door shall have a view panel, with minimum dimensions of 8 inches by 42 inches (1067 mm)

and a maximum of 1,296 square inches (.84 m²), of ¼ inch (6 mm) tempered or safety glass installed with the bottom edge of the panel at 30 inches (762 mm) AFF. Each exterior door shall be protected from the elements by a roof overhang.

423.27.8.2 Roofed platform. All exterior doors shall open onto a minimum 5 foot by 5 foot (1524 mm by 1524 mm) roofed platform with handrails, which is level with the interior floor.

423.27.9 Operable windows. Classrooms shall have operable windows equal to at least 5 percent of the floor area of the unit where required by Section 1013.44, *Florida Statutes*. Exterior doors may be included in computing the required 5 percent. Awning, casement, or projecting windows shall not be placed in walls with adjacent walks, ramps, steps or platforms.

423.27.9.1 Rescue. Windows for emergency rescue shall comply with NFPA 101, Florida edition as adopted by the *Florida Fire Prevention Code*, shall be operable from the inside by a single operation and shall be labeled “EMERGENCY RESCUE—KEEP AREA CLEAR.”

423.27.10 Finishes. Finishes in relocatable units shall comply with the following:

423.27.10.1 Interior walls and ceilings. Interior wall and ceiling finishes in classrooms and other student use spaces shall be Class A or B as defined in NFPA 101, Florida edition as adopted by the *Florida Fire Prevention Code*. Corridor finishes shall be Class A. Formaldehyde levels shall not exceed the minimum HUD standards for manufactured housing.

423.27.10.2 Floors. Floors shall be covered with resilient material, carpet, or other finished product. Carpet in classrooms shall be tested and certified by the manufacturer as passing the Radiant Panel Test Class II. Carpet in corridors shall be tested and certified by the manufacturer as passing the Radiant Panel Test Class I.

423.27.10.3 Toilet rooms, showers and bathing facilities. Partitions and walls separating group toilet rooms shall be extended to the bottom of the roof deck.

423.27.10.3.1 Toilet room floors and base shall be finished with impervious nonslip materials. Toilet room walls shall be finished with impervious materials which shall be extended to a minimum height of 6 feet (1828 mm).

423.27.10.3.2 Ceilings shall be of solid-type moisture-resistant materials.

423.27.11 Fire extinguishers. At least one appropriate fire extinguisher shall be provided in each relocatable classroom unit and in each classroom of a multiclassroom building.

423.27.12 Document storage. Provision shall be made to secure foundation plans and to post the annual fire inspection report within each relocatable unit.

423.27.13 Time-out rooms. Time-out rooms are not recommended but, when provided, shall comply with the specific requirements for time-out rooms found elsewhere in these public educational facilities code requirements.

423.27.14 Child care/day care units. Standard classroom units intended to house birth to age 3 children, including Teenage Parent Programs (TAP), shall meet the additional criteria under the title of *Child Care/Day Care/Prekindergarten Facilities* for permanent buildings contained in these public educational facilities requirements, as well as the following:

423.27.14.1 All TAP spaces where residential kitchens are provided shall have two doors exiting directly to the outside and remotely located from each other. Areas designated for children's sleeping mats, cots or cribs, shall have a clearly marked exit passageway.

423.27.15 Illumination required. Illumination in classroom units shall be designed to provide an average maintained 50 footcandles (500 lux) at desk top.

423.27.15.1 Emergency lighting. Each classroom unit shall be equipped with emergency lighting.

423.27.15.2 Exterior lighting. Exterior lighting shall be provided as required elsewhere in these public educational facilities code requirements.

423.27.15.3 Exit lighting. Exit lights shall be provided as required by the *Uniform Fire Safety Standards* adopted by the State Fire Marshal.

423.27.16 Air conditioning, heating and ventilation. Relocatable facilities shall meet *Florida Building Code* requirements.

423.27.17 Technology. Relocatables shall contain wiring and computer technology appropriate for the programs to be housed.

423.27.18 Fire safety requirements. New relocatables shall be provided with fire alarm devices meeting the code requirements for permanent educational facilities and shall be connected to the facility's main fire alarm system as required by code.

423.27.19 Inspection of units during construction. Boards shall provide for the inspection of relocatables during construction, as required by the *Florida Building Code*, as authorized by statute.

423.27.20 Inspection of units prior to occupancy. Prior to occupancy new relocatables shall be inspected and approved for compliance to the *Florida Building Code*. New units shall have foundation plans provided and secured, in the relocatable along with the local fire inspector report. Certification of such inspection shall remain on file with the district. Inventory/date of construction signage shall be affixed to the relocatable. Where FRTW is used inspection access panels shall be provided and within easy reach to facilitate inspection for general condition assessment of FRTW and connectors.

SECTION 424 SWIMMING POOLS AND BATHING PLACES (PUBLIC AND PRIVATE)

424.1 Public swimming pools and bathing places. Public swimming pools and bathing places shall comply with the design and construction standards of this section.

NOTE: Other administrative and programmatic provisions may apply. See Department of Health (DOH) Rule 64E-9, *Florida Administrative Code* and Chapter 514, *Florida Statutes*.

“Bathing load” means the maximum number of persons allowed in the pool at one time.

“Collector tank” means a reservoir, open to the atmosphere, from which the recirculation pump takes suction, which may receive the gravity flow from the main drain line and surface overflow system.

“Interactive water features” means a structure designed to allow for recreational activities with recirculated, filtered, and treated water; but having minimal standing water. Water from the interactive fountain type features is collected by gravity below grade in a collector tank or sump. The water is filtered, disinfected and then pumped to the feature spray discharge heads.

“Perimeter overflow gutter” means a level trough or ledge around the inside perimeter of the pool containing drains to clean the pool water surface.

“Plunge pool” means the receiving body of water located at the terminus of a recreational water slide.

“Pool floor” means the interior pool bottom surface which consists of that area from a horizontal plane up to a maximum of a 45-degree slope.

“Pool wall” means the interior pool side surfaces which consist of that area from a vertical plane to a 45-degree slope.

“Precoat pot” means a container with a valved connection to the suction side of the recirculation pump of a pressure diatomaceous earth (D.E.) filter system used for coating the filter with D. E. powder.

A **“public swimming pool”** or **“public pool”** means a water-tight structure of concrete, masonry, or other approved materials which is located either indoors or outdoors, used for bathing or swimming by humans, and filled with a filtered and disinfected water supply, together with buildings, appurtenances, and equipment used in connection therewith. A public swimming pool or public pool shall mean a conventional pool, spa-type pool, wading pool, special purpose pool, or water recreation attraction, to which admission may be gained with or without payment of a fee and includes, but is not limited to, pools operated by or serving camps, churches, cities, counties, day care centers, group home facilities for eight or more clients, health spas, institutions, parks, state agencies, schools, subdivisions, or the cooperative living-type projects of five or more living units, such as apartments, boardinghouses, hotels, mobile home parks, motels, recreational vehicle parks, and townhouses. The term does not include a swimming pool located on the grounds of a private residence.

“**Recirculation system**” means the system of piping and mechanics designed to remove the water from the pool then filter, disinfect and return it to the pool.

“**Slip resistant**” means having a textured surface which is not conducive to slipping under contact of bare feet unlike glazed tile or masonry terrazzo and nontextured plastic materials. manufactured surface products shall be designated by the manufacturer as suitable for walking surfaces in wet areas.

“**Spa pool**” means a pool used in conjunction with high-velocity air or water.

“**Special purpose pool**” means a public pool used exclusively for a specific, supervised purpose, including springboard or platform diving training, SCUBA diving instruction, and aquatic programs for persons with disabilities, preschool or kindergarten children.

“**Wading pool**” means a shallow pool designed to be used by children.

“**Water recreation attraction**” means a facility with design and operational features that provide patron recreational activity and purposefully involves immersion of the body partially or totally in the water. Water recreation attractions include water slides, lazy river rides, water course rides, water activity pools, and wave pools.

“**Lazy river ride**” means a water recreation attraction designed to convey bathers around a relatively flat course using an artificially created current.

“**Wade pool**” means a water recreation attraction ride which is characterized by having trough-like or tubular flumes or chutes.

“**Wet deck area**” means the 4-foot-wide (1219 mm) unobstructed pool deck area around the outside of the pool water perimeter, curb, ladders, handrails, diving boards, diving towers, or pool slides.

“**Zero depth entry pool**” means a pool where the pool floor continues to slope upward to a point where it meets the surface of the water and the pool deck.

424.1.1 Sizing. The bathing load for conventional swimming pools and special purpose pools shall be computed on the basis of one person per 5 gpm (.32 L/s) of recirculation flow. The bathing load for wading pools and interactive water features shall be established by averaging one person per 10 square feet (.9 m²) of pool area and one person per 5 gpm (.32 L/s) of filter rate. The bathing load for spa type pools shall be based on one person per each 10 square feet (.9 m²) of surface area. The filtration system shall be capable of meeting all other requirements of these rules while providing a flowrate of at least 1 gpm (.06 L/s) for each living unit at transient facilities and ³/₄ gpm (.04 L/s) at nontransient facilities. All other types of projects shall be sized according to the anticipated bathing load and proposed uses. For the purpose of determining minimum pool size only, the pool turnover period used cannot be less than 3 hours.

424.1.2 Swimming pool construction standards.

424.1.2.1 Pool structure. Pools shall be constructed of concrete or other impervious and structurally rigid material. All pools shall be watertight, free from structural cracks and shall have a nontoxic smooth and slip-resistant finish. Tile

used in less than 5 feet (1524 mm) of water must be slip resistant except for bull-nose tile when utilized as step, bench or swimout markings.

424.1.2.2 Dimensions.

424.1.2.2.1 Dimensional standards. Dimensional standards for competition type pools shall be those published by the National Collegiate Athletic Association, 1990; Federation Internationale de Natation Amateur (FINA), 1998-2000 Handbook; 1998-1999 Official Rules of Diving & Code Regulation of United States Diving Inc.; 1998 United States Swimming Rules and Regulations, and National Federation of State High School Associations, 1997-1998, which are incorporated by reference in this code.

424.1.2.2.2 Walls and corners. All pool walls shall have a clearance of 15 feet (4572 mm) perpendicular to the wall. Offset steps and spa coves are exempt from this clearance requirement. The upper part of pool walls in areas 5 feet deep or less shall be within 5 degrees (4572 mm) vertical for a minimum depth of 2½ feet (762 mm) from which point the wall may join the floor with a maximum radius equal to the difference between the pool depth and 2½ feet. The upper part of pool walls in areas over 5 feet deep shall be within 5 degrees vertical for a minimum depth equal to the pool water depth minus 2½ feet (762 mm) from which point the wall may join the floor with a maximum radius of 2½ feet (762 mm). Corners shall be a minimum 90-degree angle. The corner intersections of walls which protrude or angle into the pool water area shall be rounded with a minimum radius of 2 inches (51 mm).

424.1.2.2.3 Pool floor slope and slope transition. The radius of curvature between the floor and walls is excluded from these requirements. multiple floor levels in pools are prohibited.

424.1.2.2.3.1 Floor slope shall be uniform. The floor slope shall be a maximum 1 unit vertical in 10 units horizontal and a minimum of 1 unit vertical in 40 units horizontal in areas 5 feet (1524 mm) deep or less. The floor slope shall be a maximum 1 unit vertical in 3 units horizontal in areas more than 5 feet (1524 mm) deep.

424.1.2.2.3.2 Any transition in floor slope shall occur at a minimum of 5 feet (1524 mm) of water depth. A slope transition shall have a 2-inch-wide (51 mm) dark contrasting marking across the bottom and must extend up both sides of the pool at the transition point. A slope transition shall have a safety line mounted by use of cup anchors, 2 feet (610 mm) before the contrasting marking, toward the shallow end. The safety line shall have visible floats at maximum 7-foot (2134 mm) intervals.

424.1.2.2.4 Pool depths. The minimum water depth shall be 3 feet (914 mm) in shallow areas and 4 feet (1219 mm) in deep areas.

424.1.2.3 Markings.

424.1.2.3.1 Depth markings. Depth markings shall meet the following criteria:

1. Permanent depth markings followed by the appropriate full or abbreviated words “FEET” or “INCHES” shall be installed in minimum 4-inch-high (102 mm) numbers and letters on a contrasting background. Depth markers shall indicate the actual pool depth, within 3 inches (76 mm), at normal operating water level when measured 3 feet (914 mm) from the pool wall. Symmetrical pool designs with the deep point at the center may be allowed provided a dual marking system is used which indicates the depth at the wall and at the deep point.
2. The markings shall be located on both sides of the pool at the shallow end, slope break, deep end wall and deep point (if located more than five feet from the deep end wall) with a maximum perimeter distance between depth markings of 25 feet (7620 mm) and shall be legible from inside the pool and also from the pool deck.
3. When a curb is provided, the depth markings shall be installed on the inside and outside or top of the pool curb. When a pool curb is not provided, the depth markings shall be located on the inside vertical wall at or above the water level and on the edge of the deck within two feet of the pool water. When open type gutter designs are utilized, depth markers shall be located on the back of the gutter wall.
4. When deck level perimeter overflow systems are utilized, additional depth markers shall be placed on adjacent fencing or walls and the size shall be increased so they are recognizable from inside the swimming pool. Depth markers on the pool deck shall be within three feet of the water.
5. Those areas of the pool that are not part of an approved diving bowl shall have dark contrasting, permanent, 4-inch-high (102 mm) “NO DIVING” markings installed on the top of the pool curb or deck within 2 feet (610 mm) of the pool water on each side of the pool with a maximum distance of 25 feet (7620 mm) between markings. A 6-inch (152 mm) tile with a 4-inch (102 mm) or larger red, international “NO DIVING” symbol may be substituted for the “NO DIVING” markings.
6. All depth markings shall be tile, except that pools constructed of fiberglass, thermoplastic or stainless steel may substitute other type markings when it can be shown that said markings are permanent and will not fade over time. This exemption does not extend to concrete pools that are coated with fiberglass. All depth and “NO DIVING” markings installed on horizontal surfaces shall have a slip-resistant finish.

424.1.2.3.2 Designs or logos. Any design or logo on the pool floor or walls shall be such that it will not hinder the detection of a human in distress, algae, sediment, or other objects in the pool.

424.1.2.3.3 Lane markings. Pools that are not intended to be utilized for officially sanctioned competition may install lap lane markings provided they meet the following criteria: the markings must be 4 inches (102 mm) wide, they must terminate 5 feet (1524 mm) from the end wall in a “T” with the “T” bar at least 18 inches (1524 mm) long, they must be placed at 7-foot (2134 mm) intervals on center and be no closer than 4 feet (1219 mm) from any side wall, steps or other obstructions.

424.1.2.3.4 Targets. Pools that are not intended for officially sanctioned competition may have up to 4-inch (102 mm) wide 18-inch by 18-inch (457 mm by 457 mm) targets (+) installed on the pool wall.

424.1.2.4 Color. Pool floors and walls shall be white or light pastel in color and shall have the characteristic of reflecting rather than absorbing light.

Exception: A dark color may be used if (1) a tile line [minimum 4 inches (102 mm), maximum 12 inches (305 mm)] is installed at the water line or (2) if 2-inch (51 mm) tile is installed along the pool wall edge of the gutter lip for gutter type pools.

424.1.2.5 Access. All pools shall have a means of access every 75 feet (22 860 mm) of pool perimeter with a minimum of two, located so as to serve both ends of the pool. When the deep portion of the pool is over 30 feet (9144 mm) wide both sides of this area shall have a means of access. Access shall consist of ladders, stairs, recessed treads or swimouts and may be used in combination. All treads shall have a slip-resistant surface.

424.1.2.5.1 Ladders. Ladders shall be of the cross-braced type and shall be constructed of corrosion-resistant materials and be securely anchored into the pool deck. Clearance between the ladder and pool wall shall be between 3 to 6 inches (76 mm to 152 mm). Ladders shall extend at least 28 inches (711 mm) above the pool deck.

424.1.2.5.2 Recessed treads. Recessed treads shall be installed flush with the wall and shall be a minimum five inches wide, 10 inches (254 mm) long, with a maximum vertical distance of 12 inches (305 mm) between treads.

424.1.2.5.3 Stairs. Stairs shall have a minimum tread width of 10 inches (254 mm) for a minimum tread length of 24 inches (610 mm) and a maximum riser height of 10 inches (254 mm). Treads and risers between the top and bottom treads shall be uniform in width and height. The front $\frac{3}{4}$ to 2 inches (19.1 to 51 mm) of the tread and the top 2 inches (51 mm) of the riser shall be tile, dark in color, contrasting with the interior of the pool. Tile shall be slip resistant, except when $\frac{3}{4}$ inch by 2-inch (51 mm) bull-nose tile is used and the $\frac{3}{4}$ inch (19 mm) segment is placed on the

tread and the 2-inch (51 mm) segment is on the riser. All markings shall be tile, except that pools constructed of fiberglass, thermoplastic or stainless steel may substitute other type markings when it can be shown that said markings are permanent and will not fade over time. This exception does not extend to concrete pools that are coated with fiberglass.

424.1.2.5.4 Swimouts. Swimouts shall extend 18 to 24 inches (610 mm) back from the pool wall, shall be 4 to 5 feet (1219 mm to 1524 mm) wide, shall be a maximum of 12 inches (305 mm) below the deck, unless stairs are provided in the swimout, and shall be located only in areas of the pool greater than 5 feet (1524 mm) deep. Pools that do not utilize a continuous perimeter overflow system must provide a wall return inlet in the swimout for circulation. A permanent dark contrasting colored band of tile shall be installed at the intersection of the pool wall and the swimout and must extend 2 inches (51 mm) on the horizontal and vertical surfaces. Tile must be slip resistant, except that bull-nose tile may be substituted and installed in accordance with Section 424.1.2.5.3 above.

424.1.2.5.5 Handrails and grabrails. Handrails shall be provided for all stairs, shall be anchored in the bottom step and the deck. Where “figure 4” deck-mounted type handrails are used, they shall be anchored in the deck and extend laterally to any point vertically above the bottom step. A grabrail shall be provided for all swimouts and shall not protrude more than 6 inches (152 mm) over the water surface. Grabrails must be mounted in the pool deck at each side of recessed steps. Handrails and grabrails shall extend at least 28 inches (28 mm) above the step edge and deck.

424.1.2.5.6 Disabled access. Permanent or portable steps, ramps, handrails, lifts or other devices designed to accommodate persons with disabilities in swimming pools may be provided. Lifts mounted into the pool deck shall have a minimum 4-foot-wide (1219 mm) deck behind the lift mount.

424.1.2.6 Obstructions. The pool water area shall be unobstructed by any type structure unless justified by engineering design as a part of the recirculation system. Engineering design and material specifications shall show that such structures will not endanger the pool patron, can be maintained in a sanitary condition and will not create a problem for sanitary maintenance of any part of the pool, pool water, or pool facilities. Structures in accord with the above shall not be located in a diving bowl area or within 15 feet (4572 mm) of any pool wall.

Exceptions:

1. Stairs, ladders and ramps, necessary for entrance/exit from the pool are not considered obstructions.
2. Underwater seat benches may be installed in areas less than 5 feet (1524 mm) deep. Bench seats must be 14 to 18 inches (356 to 457 mm) wide and must have a dark contrasting marking

on the seat edge extending 2 inches (51 mm) on the horizontal and vertical surface. If tile is used it must be slip resistant, except that bullnose tile may be substituted and installed in accordance with Section 424.1.2.5.3.

424.1.2.7 Diving areas. Diving facilities shall meet the minimum requirements of the FINA dimensions for diving facilities in accordance with the 1998-2000 FINA Handbook and include the following:

1. Diving boards or platforms with heights of less than the established standard shall meet the dimensional requirements of the next greater height.
2. Diving boards, platforms and ladders shall have a nonabsorbent, slip-resistant finish and be of sufficient strength to safely carry the anticipated loads. Diving equipment one meter and greater shall have guard rails which are at least 36 inches (914 mm) above the diving board and extend to the edge of the pool wall. All diving boards over 21 inches (533 mm) from the deck shall be provided with a ladder. Diving boards or platforms shall not be installed on curved walls where the wall enters into the defined rectangular diving area specified in this section. Adjacent platform and diving boards shall be parallel.
3. The location of pool ladders shall be such that the distance from the ladder to any point on a diving board or platform centerline is not less than the plummet to side wall dimension (b) indicated in the FINA standards. Trampoline-type diving facilities are prohibited.
4. Diving targets may be installed in accordance with FINA standards.

424.1.3 Pool appurtenances.

424.1.3.1 Decks and walkways.

424.1.3.1.1 Pool wet decks shall be constructed of concrete or other nonabsorbent material having a smooth slip-resistant finish. Wet deck area finishes shall be designed for such use and shall be installed in accordance with the manufacturer’s specifications. Wooden decks and walkways are prohibited.

424.1.3.1.2 Pool wet decks shall be uniformly sloped at a minimum of 2 percent to a maximum of 4 percent away from the pool or to deck drains to prevent standing water. When a curb is provided, the deck shall not be more than 10 inches (254 mm) below the top of the curb.

424.1.3.1.3 Pool wet decks shall have a minimum unobstructed width of 4 feet (1219 mm) around the perimeter of the pool, pool curb, ladders, handrails, diving boards, diving towers and slides.

424.1.3.1.4 Traffic barriers shall be provided as needed so that parked vehicles do not extend over the deck area.

424.1.3.1.5 Walkways shall be provided between the pool and the sanitary facilities, and shall be con-

structed of concrete or other nonabsorbent material having a smooth slip-resistant finish for the first 15 feet (4572 mm) of the walkway measured from the nearest pool water's edge. A hose bibb with a vacuum breaker shall be provided to allow the deck to be washed down with potable water.

424.1.3.1.6 Ten percent of the deck along the pool perimeter may be obstructed. Obstructions shall have a wet deck area behind or through them, with the near edge of the walk within 15 feet (4572 mm) of the water. These obstructions shall be protected by a barrier or shall be designed to discourage patron access. When an obstruction exists in multiple areas around the pool the minimum distance between obstructions shall be 4 feet (1219 mm).

424.1.3.1.7 Food or drink service facilities shall not be located within 12 feet (3658 mm) of the water's edge.

424.1.3.1.8 The vertical clearance above the pool deck shall be at least 7 feet (2137 mm).

424.1.3.1.9 All public pools shall be surrounded by a minimum 48 inch (1219 mm) in height fence. The fence shall be continuous around the perimeter of the pool area that is not otherwise blocked or obstructed by adjacent buildings or structures and shall adjoin with itself or abut to the adjacent members. Access through the barrier other than from doored exits of adjacent building(s) shall be through self-closing, self-latching lockable gates of 48 inch (1219 mm) minimal height with the latch located near the top. Consideration shall be given to the U.S. Consumer Product Safety Commission (CPSC) Pub. No. 362 guidelines. Safety covers that comply with ASTM F 1346 do not satisfy this requirement.

424.1.3.2 Bridges and overhead obstructions. Bridges and overhead obstructions over the pool shall be designed so they will not introduce any contamination to the pool water. The minimum height of the bridge or obstruction shall be at least 8 feet (2438 mm) from the bottom of the pool and at least 4 feet (1219 mm) above the surface of the pool. Minimum 42-inch-high (1067 mm) handrails shall be provided along each side of the bridge. The walking surfaces shall be constructed of concrete or other nonabsorbent material having a smooth slip-resistant finish.

424.1.4 Electrical systems.

424.1.4.1 Electrical equipment and wiring. Electrical equipment wiring and installation, including the grounding of pool components shall conform with Chapter 27 of the *Florida Building Code, Building*.

424.1.4.2 Lighting. Artificial lighting shall be provided at all swimming pools which are to be used at night or which do not have adequate natural lighting so that all portions of the pool, including the bottom, may be readily seen without glare.

424.1.4.2.1 Outdoor pool lighting. Overhead lighting shall provide a minimum of 3 footcandles (30 lux) of

illumination at the pool water surface and the pool deck surface. Underwater lighting shall be a minimum of $1\frac{1}{2}$ watt per square foot of pool water surface area.

424.1.4.2.2 Indoor pool lighting. Overhead lighting shall provide a minimum of 10 foot candles of illumination at the pool water surface and the pool deck surface. Underwater lighting shall be a minimum of $\frac{8}{10}$ watt per square foot of pool surface area.

424.1.4.2.3 Underwater lighting. Underwater lighting shall utilize transformers and low-voltage circuits with each underwater light being grounded. The maximum voltage for each light shall be 15 volts and the maximum incandescent lamp size shall be 300 watts. The location of the underwater lights shall be such that the underwater illumination is as uniform as possible and shall not be less than 18 inches (457 mm) below the normal operating water level. All underwater lights which depend upon submersion for safe operation shall have protection from overheating when not submerged. Underwater lighting requirements can be waived when the overhead lighting provides at least 15 footcandles (150 lux) of illumination at the pool water surface and pool deck surface. Alternative lighting systems which do not utilize electricity in the pool or on the pool deck, such as fiber-optic systems, may be utilized if the applicant demonstrates to reasonable certainty that the system development has advanced to the point that the pool illumination is equal to the requirements in Sections 424.1.4.2.1 and 424.1.4.2.2 above.

424.1.4.2.4 Overhead wiring. Overhead service wiring shall comply with the currently adopted *National Electrical Code*, NFPA 70.

424.1.5 Equipment area or rooms.

424.1.5.1 Outdoor equipment. Equipment designated by the manufacturer for outdoor use may be located in an equipment area. An equipment area shall be enclosed by four-sided fencing that is at least 4 feet (1219 mm) high with a self-closing and self-latching gate and has a permanent locking device. An equipment room shall be protected on at least three sides and overhead. The fourth side may be a gate, fence, or open if otherwise protected from unauthorized entrance. The equipment area or room floor shall be of concrete or other nonabsorbent material having a smooth slip-resistant finish and shall have positive drainage, including a sump pump if necessary.

424.1.5.2 Indoor equipment. Equipment not designated by the manufacturer for outdoor use shall be located in an equipment room. An equipment room shall be protected on at least three sides and overhead. The fourth side may be a gate, fence or open if otherwise protected from unauthorized entrance.

424.1.5.3 materials. The equipment area or room floor shall be of concrete or other nonabsorbent material having a smooth slip-resistant finish and shall have positive drainage, including a sump pump if necessary.

424.1.5.4 Ventilation. Equipment rooms shall have either forced draft or cross ventilation. All below-grade

equipment rooms shall have a stairway access with forced draft ventilation or a fully louvered door and louvered vent on at least one other side.

424.1.5.5 Access. The opening to an equipment room or area shall be a minimum 3 feet by 6 feet (914 mm by 1829 mm) and shall provide easy access to the equipment.

424.1.5.6 Size. The size of the equipment room or area shall provide working space to perform routine operations. Clearance shall be provided for all equipment as prescribed by the manufacturer to allow normal maintenance operation and removal without disturbing other piping or equipment. In rooms with fixed ceilings, the minimum height shall be 7 feet (2137 mm).

424.1.5.7 Lighting. Equipment rooms or areas shall be lighted to provide 30 footcandles (300 lux) of illumination at floor level.

424.1.5.8 Storage. Equipment rooms or areas shall not be used for storage of chemicals emitting corrosive fumes or for storage of other items to the extent that entrance to the room for inspection or operation of the equipment is impaired.

424.1.5.9 Hose bibbs. A hose bibb with vacuum breaker shall be located in the equipment room or area.

424.1.6 Plumbing systems.

424.1.6.1 Sanitary facilities. Separate sanitary facilities shall be provided and labeled for each sex and shall be located within a 200-foot (60 960 mm) radius of the nearest water’s edge of each pool served by the facilities.

Exception: Where a swimming pool serves only a designated group of residential dwelling units and not the general public, poolside sanitary facilities are not required if all living units are within a 200-foot (60 960 mm) radius of the nearest water’s edge, are not over three stories in height and are each equipped with private sanitary facilities.

424.1.6.1.1 Required fixtures. Fixtures shall be provided as indicated on Table 424.1.6.1.

424.1.6.1.2 Outside access. Outside access to facilities shall be provided for bathers at outdoor pools. If they are not visible from any portion of the pool deck, signs shall be posted showing directions to the facilities.

Directions shall be legible from any portion of the pool deck; letters shall be a minimum of 1 inch (25 mm) high.

424.1.6.1.3 Sanitary facility floors. Floors of sanitary facilities shall be constructed of concrete or other nonabsorbent materials, shall have a smooth, slip-resistant finish, and shall slope to floor drains. Carpets, duckboards and footbaths are prohibited. The intersection between the floor and walls shall be covered.

424.1.6.1.4 Hose bibb. A hose bibb with vacuum breaker shall be provided near each restroom to allow for ease of cleaning.

424.1.6.2 Rinse shower. A minimum of one rinse shower shall be provided on the pool deck of all outdoor pools within 20 feet (60 960 mm) of the nearest pool water’s edge.

424.1.6.3 Cross-connection prevention. An atmospheric break or approved back flow prevention device shall be provided in each pool water supply line that is connected to a public water supply. Vacuum breakers shall be installed on all hose bibbs.

424.1.6.4 Plastic pipes. Plastic pipe subject to a period of prolonged sunlight exposure shall be coated to protect it from ultraviolet light degradation.

424.1.6.5 Recirculation and treatment systems.

424.1.6.5.1 Equipment testing. Recirculation and treatment equipment such as filters, recessed automatic surface skimmers, ionizers, ozone generators, disinfection feeders and chlorine generators shall be tested and approved using the ANSI/NSF International Standard 50, *Circulation System Components and Related materials for Swimming Pool, Spas/Hot Tubs*, dated October 28, 1996, which is incorporated by reference.

424.1.6.5.2 Volume. The recirculation system shall be designed to provide a minimum of four turnovers of the pool volume per day. Pools that are less than 1,000 square feet (93 m²) at health clubs shall be required to provide eight turnovers per day.

424.1.6.5.3 System design. The design pattern of recirculation flow shall be 100 percent through the

**TABLE 424.1.6.1
PUBLIC SWIMMING POOL FIXTURES REQUIRED**

SIZE OF POOL	MEN'S RESTROOM			WOMEN'S RESTROOM	
	Urinals	WC	Lavatory	WC	Lavatory
0 - 2,500 sq. ft.	1	1	1	1	1
2,501 - 5,000 sq. ft.	2	1	1	5	1
5,001 - 7,500 sq. ft.	2	2	2	6	2
7,501 - 10,000 sq. ft.	3	3	3	9	3

For SI: 1 square foot = 0.0929 m².

An additional set of fixtures shall be provided in the men’s restroom for every 5,000 square feet or major fraction thereof for pools greater than 10,000 square feet.

Women’s restrooms shall have a ratio of three to two water closets provided for women as the combined total of water closets and urinals provided for men.

main drain piping and 100 percent through the perimeter overflow system or 60 percent through the skimmer system.

424.1.6.5.3.1 Perimeter overflow gutters. The lip of the gutter shall be uniformly level with a maximum tolerance of $\frac{1}{4}$ inch (6 mm) between the high and low areas. The bottom of the gutter shall be level or slope to the drains. The spacing between drains shall not exceed 10 feet (3048 mm) for 2-inch (51 mm) drains or 15 feet (4572 mm) for $2\frac{1}{2}$ -inch (64 mm) drains, unless hydraulically justified by the design engineer.

424.1.6.5.3.1.1 Either recessed type or open type gutters shall be used. Special designs can be approved provided they are within limits of sound engineering practice. Recessed type gutters shall be at least 4 inches (102 mm) deep and 4 inches (102 mm) wide. No part of the recessed gutter shall be visible from a position directly above the gutter sighting vertically down the edge of the deck or curb. Open-type gutters shall be at least 6 inches (150 mm) deep and 12 inches (305 mm) wide. The gutter shall slope 2 inches (51 mm), $\pm\frac{1}{4}$ inch (± 6 mm), from the lip to the drains. The gutter drains shall be located at the deepest part of the gutter.

424.1.6.5.3.1.2 All gutter systems shall discharge into a collector tank.

424.1.6.5.3.1.3 The gutter lip shall be tiled with a minimum of 2-inch (51 mm) tile on the pool wall. The back vertical wall of the gutter shall be tiled with glazed tile.

Exception: Stainless steel gutter systems when it can be shown that the surfaces at the waterline and back of the gutter are easily cleanable.

424.1.6.5.3.2 Recessed automatic surface skimmers. Recessed automatic surface skimmers may be utilized when the pool water surface area is 1,000 square feet (93 m³) or less excluding offset stairs and swimouts and the width of the pool is not over 20 feet (6096 mm).

424.1.6.5.3.2.1 Volume. The recessed automatic surface skimmer piping system shall be designed to carry 60 percent of the pool total design flow rate with each skimmer carrying a minimum 30 gpm (2 L/s). One skimmer for every 400 square feet (37 m²) or fraction thereof of pool water surface area shall be provided.

424.1.6.5.3.2.2 Location. Prevailing wind direction and the pool outline shall be considered in the selection of skimmer locations. The location of skimmers shall be such that the interference of adjacent inlets and skimmers is minimized. Recessed automatic surface skimmers shall be installed so that there is no protrusion

into the pool water area. The deck or curb shall provide for a handhold around the entire pool perimeter and shall not be located more than 9 inches (229 mm) above the mid point of the opening of the skimmer.

424.1.6.5.3.2.3 Equalizers. Recessed automatic surface skimmers shall be installed with an equalizer valve and an equalizer line when the skimmer piping system is connected directly to pump suction. The equalizer valve shall be a spring loaded vertical check valve which will not allow direct suction on the equalizer line. The equalizer line inlet shall be installed at least 1 foot (305 mm) below the normal pool water level and the equalizer line inlet shall be protected by a grate. The equalizer line shall be sized to handle the expected flow with a 2-inch (51 mm) minimum line size.

424.1.6.5.3.2.4 Wall-inlet fitting. A wall-inlet fitting shall be provided directly across from each skimmer.

424.1.6.5.3.2.5 Waterline tile. A minimum 6-inch (152 mm) water line tile shall be provided on all pools with automatic skimmer systems. Glazed tile shall be utilized.

424.1.6.5.4 Pumps. If the pump or suction piping is located above the water level of the pool, the pump shall be self-priming. Pumps that take suction prior to filtration shall be equipped with a hair and lint strainer. The recirculation pump shall be selected to provide the required recirculation flow against a minimum total dynamic head of 60 feet (18 288 mm) unless hydraulically justified by the design engineer. Vacuum D.E. filter system pumps shall provide at least 50 feet (15 240 mm) of total dynamic head. Should the total dynamic head required not be appropriate for a given project, the design engineer shall provide an alternative.

424.1.6.5.5 Filters. Filters sized to handle the required recirculation flow shall be provided.

424.1.6.5.5.1 Filter capacities. The maximum filtration rate in gallons per minute per square foot of filter area shall be: 15 (20 if so approved using the procedure stated in Section 424.1.6.5.1 for high rate sand filters, 3 for rapid sand filters, 0.075 for pleated cartridge filters and 2 for D.E. filters).

424.1.6.5.5.2 Filter appurtenances.

424.1.6.5.5.2.1 Pressure filter systems. Pressure filter systems shall be equipped with an air relief valve, influent and effluent pressure gauges with minimum face size of 2 inches (51 mm) reading 0-60 psi (0-414 kPa), and a sight glass when a backwash line is required.

424.1.6.5.5.2.2 Vacuum filter systems. Vacuum filter systems shall be equipped with a vacuum gauge which has a 2-inch (51 mm) face and reads from 0-30 inches of mercury.

424.1.6.5.5.2.3 D.E. systems. A precoat pot or collector tank shall be provided for D.E. systems.

424.1.6.5.5.3 Filter tanks and elements. The filter area shall be determined on the basis of effective filtering surfaces with no allowance given for areas of impaired filtration, such as broad supports, folds, or portions which may bridge. Filter elements shall have a minimum 1-inch (25 mm) clear spacing between elements up to a 4 square foot (.4 m²) effective area. The spacing between filter elements shall increase $\frac{1}{8}$ inch (3 mm) for each additional square foot of filter area or fraction thereof above an effective filter area of 4 square feet (.4 m²). All cartridges used in public pool filters shall be permanently marked with the manufacturer's name, pore size and area in square feet of filter material. All cartridges with end caps shall have the permanent markings on one end cap. Vacuum filter tanks shall have covered intersections between the wall and the floor and the tank floor shall slope to the filter tank drain. The filter tank and elements shall be installed such that the recirculation flow draw down does not expose the elements to the atmosphere whenever only the main drain valve is open or only the surface overflow gutter system valve is open.

424.1.6.5.5.6 Piping. All plastic pipe used in the recirculation system shall be imprinted with the manufacturer's name and the NSF-pw logo for potable water applications. Size, schedule and type of pipe shall be included on the drawings. Plastic pipe subject to a period of prolonged sunlight exposure shall be coated to protect it from ultraviolet light degradation.

424.1.6.5.5.7 Valves. Return lines, main drain lines, and surface overflow system lines, shall each have proportioning valves.

424.1.6.5.5.8 Flow velocity. Pressure piping shall not exceed 8 feet per second (2438 mm/s), except that precoat lines with higher velocities may be used when necessary for agitation purposes. The flow velocity in suction piping shall not exceed 6 feet per second (1829 mm/s) except that flow velocities up to 10 feet per second (3048 mm/s) in filter assembly headers will be acceptable. main drain systems and surface overflow systems which discharge to collector tanks shall be sized with a maximum flow velocity of 3 feet per second (914 mm/s). The filter and vacuuming system shall have the necessary valves and piping to allow filtering to pool, vacuuming to waste, vacuuming to filter, complete drainage of the filter tank, backwashing for sand and pressure D.E. filters and precoat recirculation for D.E. filters.

424.1.6.5.5.9 Inlets. All inlets shall be adjustable with wall type inlets being directionally adjustable and floor type inlets having a means of flow adjustment.

424.1.6.5.9.1 Pools 30 feet (9144 mm) in width or less, with wall inlets only shall have enough inlets

such that the inlet spacing does not exceed 20 feet (6096 mm) based on the pool water perimeter.

424.1.6.5.9.2 Pools 30 feet (9144 mm) in width or less with floor inlets only shall have a number of inlets provided such that the spacing between adjacent inlets does not exceed 20 feet (6096 mm) and the spacing between inlets and adjacent walls does not exceed 10 feet (3048 mm).

424.1.6.5.9.3 A combination of wall and floor inlets may be used in pools 30 feet (9144 mm) in width or less only if requirements of Section 424.1.6.5.9.1 or Section 424.1.6.5.9.2 are fully met.

424.1.6.5.9.4 Pools greater than 30 feet (9144 mm) in width with floor inlets only shall have a number of floor inlets provided such that the spacing between adjacent inlets does not exceed 20 feet (6096 mm) and the spacing between inlets and an adjacent wall does not exceed 10 feet (3048 mm).

424.1.6.5.9.5 Pools greater than 30 feet (9144 mm) in width may have a combination of wall and floor inlets provided the number of wall inlets is such that the maximum spacing between wall inlets is 20 feet (6096 mm) and floor inlets are provided for the pool water area beyond a 15 feet (4572 mm) perpendicular distance from all walls. The number of floor inlets shall be such that the spacing between adjacent inlets does not exceed 20 feet (6096 mm) and the distance from a floor inlet and an adjacent wall does not exceed 25 feet (7620 mm). Floor inlets shall be designed and installed such that they do not protrude more than $\frac{5}{8}$ inch (16 mm) above the pool floor and all inlets shall be designed and installed so as not to constitute sharp edges or protrusions hazardous to pool bathers.

424.1.6.5.9.6 The flow rate through each inlet shall not exceed 15 gpm (1 L/s).

424.1.6.5.10 Main drain outlets. All pools shall be provided with an outlet at the deepest point.

424.1.6.5.10.1 The depth at the outlet shall not deviate more than 3 inches (76 mm) from the side wall.

424.1.6.5.10.2 Outlets shall be covered by a secured grating which requires the use of a tool to remove and whose open area is such that the maximum velocity of water passing through the openings does not exceed $1\frac{1}{2}$ feet per second (457 mm/s) at 100 percent of the design recirculation flow.

424.1.6.5.10.3 Multiple outlets, equally spaced from the pool side walls and from each other, shall be installed in pools where the deep portion of the pool is greater than 30 feet (9144 mm) in width.

424.1.6.5.10.4 If the area is subject to high ground water, the pool shall be designed to withstand hydraulic uplift or shall be provided with hydrostatic relief devices.

424.1.6.5.10.5 The main drain outlet shall be connected to a collector tank. The capacity of the collector tank shall be at least 1 minute of the recirculated flow unless justified by the design engineer. Vacuum filter tanks are considered collector tanks.

424.1.6.5.11 Water makeup control. An automatic and manual water makeup control shall be provided to maintain the water level at the lip of the overflow gutter or at the mouth of the recessed automatic surface skimmers and shall discharge through an air gap into a fill pipe or collector tank. Over the rim fill spouts are prohibited.

424.1.6.5.12 Cleaning system. A portable or plumbed in vacuum cleaning system shall be provided. All vacuum pumps shall be equipped with hair and lint strainers. When the system is plumbed in, the vacuum fittings shall be located to allow cleaning the pool with a 50-foot (15 240 mm) maximum length of hose. Vacuum fittings shall be mounted approximately 12 inches (305 mm) below the water level, flush with the pool walls, and shall be provided with a spring loaded safety cover or flush plug cover which shall be in place at all times when the pool is not being vacuumed. Bag-type cleaners, which operate as ejectors on potable water supply pressure, shall be protected by a vacuum breaker. Cleaning devices shall not be used while the pool is open to bathers.

424.1.6.5.13 Rate of flow indicators. A rate of flow indicator, reading in gpm, shall be installed on the return line. The rate of flow indicator shall be properly sized for the design flow rate and shall be capable of measuring from one-half to at least one-and-one-half times the design flow rate. The clearances upstream and downstream from the rate of flow indicator shall comply with manufacturer's installation specifications.

424.1.6.5.14 Heaters. Pool heaters shall comply with nationally recognized standards acceptable to the department and to the design engineer. Pools equipped with heaters shall have a fixed thermometer mounted in the pool recirculation line downstream from the heater outlet. Thermometers mounted on heater outlets do not meet this requirement. A sketch of any proposed heater installation including valves, thermometer, pipe sizes, and material specifications shall be included in the application for permit prior to installation. Piping and influent, effluent and bypass valves which allow isolation or removal of the heater from the system shall be provided. materials used in solar and other heaters shall be nontoxic and acceptable for use with potable water. Heaters shall not prevent the attainment of the required turnover rate.

424.1.6.5.15 Pool waste water disposal. Pool waste water shall be discharged through an air gap; disposal shall be to sanitary sewers, storm sewers, drainfields, or by other means, in accordance with local requirements including obtaining all necessary permits. Dis-

posal of water from pools using D.E. powder shall be accomplished through separation tanks which are equipped with air bleed valves, bottom drain lines, and isolation valves, or through a settling tank with final disposal being acceptable to local authorities. D.E. separator tanks shall have a capacity as rated by the manufacturer, equal to the square footage of the filter system. All lines shall be sized to handle the expected flow. There shall not be a direct physical connection between any drain from a pool or recirculation system and a sewer line.

424.1.6.5.16 Addition of chemicals. Disinfection and pH adjustment shall be added to the pool recirculation flow using automatic feeders meeting the requirement of ANSI/NSF 50. All chemicals shall be fed into the return line after the pump, heater and filters unless the feeder was designed by the manufacturer and approved by the NSF to feed to the collector tank or to the suction side of the pump.

424.1.6.5.16.1 Gas chlorination. When gas chlorination is utilized, the chlorinator shall be capable of continuously feeding a chlorine dosage of 4 mg/L to the recirculated flow of the filtration system. The application point for chlorine shall be located in the return line downstream of the filter, recirculation pump, heater, and flow meter, and as far as possible from the pool.

424.1.6.5.16.1.1 Gas chlorinators shall be located in above-grade rooms and in areas which are inaccessible to unauthorized persons.

424.1.6.5.16.1.1.1 Chlorine rooms shall have: continuous forced draft ventilation capable of a minimum of one air change per minute with an exhaust at floor level to the outside, a minimum of 30 footcandles (300 lux) of illumination with the switch located outside and the door shall open out and shall not be located adjacent to the filter room entrance or the pool deck. A shatterproof gas-tight inspection window shall be provided.

424.1.6.5.16.1.1.2 Chlorine areas shall have a roof and shall be enclosed by a chain-link type fence at least 6 feet (1829 mm) high to allow ventilation and prevent vandalism.

424.1.6.5.16.1.2 When booster pumps are used with the chlorinator, the pump shall use recirculated pool water supplied via the recirculation filtration system. The booster pump shall be electrically interlocked with the recirculation pump to prevent the feeding of chlorine when the recirculation pump is not operating.

424.1.6.5.16.1.3 A means of weighing chlorine containers shall be provided. When 150-pound (68 kg) cylinders are used, platform type scales shall be provided and shall be capable of weighing a minimum of two full cylinders at one time.

The elevation of the scale platform shall be within 2 inches (51 mm) of the adjacent floor level, and the facilities shall be constructed to allow easy placement of full cylinders on the scales.

424.1.6.5.16.2 Hypohalogenation and electrolytic chlorine generators. The hypohalogenation type feeder and electrolytic chlorine generators shall be adjustable from 0 to full range. A rate of flow indicator is required on erosion type feeders. The feeders shall be capable of continuously feeding a dosage of 6 mg/L to the minimum required turnover flow rate of the filtration systems. Solution feeders shall be capable of feeding the above dosage using a 10-percent sodium hypochlorite solution, or 5-percent calcium hypochlorite solution, whichever disinfectant is to be utilized at this facility. To prevent the disinfectant from siphoning or feeding directly into the pool or pool piping under any type failure of the recirculation equipment, an electrical interlock with the recirculation pump shall be incorporated into the system for electrically operated feeders. The minimum size of the solution reservoirs shall be at least 50 percent of the maximum daily capacity of the feeder. The solution reservoirs shall be marked to indicate contents.

424.1.6.5.16.3 Feeders for pH adjustment. Feeders for pH adjustment shall be provided on all pools, except spa pools of less than 100 square feet (9 m²) of pool water surface area and pools utilizing erosion type chlorinators feeding chlorinated isocyanurates. pH adjustment feeders shall be positive displacement type, shall be adjustable from 0 to full range, and shall have an electrical interlock with the circulation pump to prevent discharge when the recirculation pump is not operating. When soda ash is used for pH adjustment, the maximum concentration of soda ash solution to be fed shall not exceed 1/2-pound (.2 kg) soda ash per gallon of water. Feeders for soda ash shall be capable of feeding a minimum of 3 gallons (11 L) of the above soda ash solution per pound of gas chlorination capacity. The minimum size of the solution reservoirs shall not be less than 50 percent of the maximum daily capacity of the feeder. The solution reservoirs shall be marked to indicate the type of contents.

424.1.6.5.16.4 Ozone generating equipment. Ozone generating equipment may be used for supplemental water treatment on public swimming pools subject to the conditions of this section.

424.1.6.5.16.4.1 Ozone generating equipment electrical components and wiring shall comply with the requirements of the Chapter 27 of the *Florida Building Code, Building* and the manufacturer shall provide a certificate of conformance. The process equipment shall be provided with an effective means to alert the

user when a component of this equipment is not operating.

424.1.6.5.16.4.2 Ozone generating equipment shall meet the NSF 50.

424.1.6.5.16.4.3 The concentration of ozone in the return line to the pool shall not exceed 0.1 mg/L.

424.1.6.5.16.4.4 The injection point for ozone generating equipment shall be located in the pool return line after the filtration and heating equipment, prior to the halogen injection point, and as far as possible from the nearest pool return inlet with a minimum distance of 4 feet (1219 mm). Injection methods shall include a mixer, contact chamber, or other means of efficiently mixing the ozone with the recirculated water. The injection and mixing equipment shall not prevent the attainment of the required turnover rate of the recirculation system. Ozone generating equipment shall be equipped with a check valve between the generator and the injection point. Ozone generating equipment shall be equipped with an air flow m and a means to control the flow.

424.1.6.5.16.4.5 Ventilation requirements. Ozone generating equipment shall be installed in equipment rooms with either forced draft or cross draft ventilation. Below-grade equipment rooms with ozone generators shall have forced draft ventilation and all equipment rooms with forced draft ventilation shall have the fan control switch located outside the equipment room door. The exhaust fan intake for forced draft ventilation and at least one vent grille for cross draft ventilation shall be located at floor level.

424.1.6.5.16.4.6 A self-contained breathing apparatus designed and rated by its manufacturer for use in ozone contaminated air shall be provided when ozone generator installations are capable of exceeding the maximum pool water ozone contact concentration of 0.1 milligram per liter. The self-contained breathing apparatus shall be available at all times and shall be used at times when the maintenance or service personnel have determined that the equipment room ozone concentration exceeds 10 mg/L. Ozone generator installations which require the self-contained breathing apparatus shall also be provided with Draeger-type detector tube equipment which is capable of detecting ozone levels of 10 mg/L and greater.

Exception: In lieu of the self-contained breathing apparatus an ozone detector capable of detecting 1 mg/L may be used. Said detector shall be capable of stopping the production of ozone, venting the room and sounding an alarm once ozone is detected.

424.1.6.5.16.5 Ionization units may be used as supplemental water treatment on public pools subject to the condition of this section.

424.1.6.5.16.5.1 Ionization equipment and electrical components and wiring shall comply with the requirements of Chapter 27 of the *Florida Building Code, Building* and the manufacturer shall provide a certification of conformance.

424.1.6.5.16.5.2 Ionization equipment shall meet the NSF 50, *Circulation System Components and Related materials for Swimming Pools, Spas/Hot Tubs*, or equivalent, shall meet UL standards and shall be electrically interlocked with recirculation pump.

424.1.7 Wading pools.

424.1.7.1 General. Wading pools shall meet the requirements of Sections 424.1.1 through 424.1.6.5, unless otherwise indicated. Wading pools and associated piping shall not be physically connected to any other swimming pools and have no minimum width dimensions requirements.

424.1.7.2 Depths. Wading pools shall have a maximum of 2 feet (610 mm). The depth at the perimeter of the pool shall be uniform and shall not exceed 12 inches (305 mm). Where recessed automatic surface skimmers are used, the pool floor shall not be more than 12 inches (305 mm) below the deck unless steps and handrails are provided. Depth and “NO DIVING” markers are not required on wading pools.

424.1.7.3 Recirculation. Wading pools shall have a minimum of one turnover every hour. Lines from main drains shall discharge into a collector tank.

424.1.7.3.1 Skimmer equalizer lines when required shall be installed in the pool floor with a grate covering.

424.1.7.3.2 The grate cover shall be sized so as not to allow the flow to exceed 1½ feet per second (457 mm/s) when the equalizer line is operating.

424.1.7.4 Inlets. Wading pools with 20 feet (6096 mm) or less of perimeter shall have a minimum of two equally spaced adjustable inlets.

424.1.7.5 Emergency drainage. All wading pools shall have drainage to waste without a cross connection through a quick opening valve to facilitate emptying the wading pool should accidental bowel or other discharge occur.

424.1.7.6 Vacuuming. Wading pools with 200 square feet (19 mm) or more of pool water surface area shall have provisions for vacuuming.

424.1.7.7 Wading pool decks. When adjacent to swimming pools, wading pools shall be separated from the swimming pool by a fence or other similar type barrier. Wading pools shall have a minimum 10-foot (3048 mm) wide deck around at least 50 percent of their perimeter with the remainder of the perimeter deck being at least 4 feet (1219 mm) wide. There shall be at least 10 feet (3048

mm) between adjacent swimming pools and wading pools.

424.1.7.8 Lighting. Wading pools are exempt from underwater lighting requirements but shall have overhead lighting installed for night use.

424.1.8 Spa pools.

424.1.8.1 General. Spa pools shall meet the requirements of Sections 424.1.1 through 424.1.6.5, unless specifically indicated otherwise.

424.1.8.2 Color, pattern, finish. The color, pattern or finish of the pool interior shall not obscure the existence or presence of objects or surfaces within the pool.

424.1.8.3 Water depths. Spa type pools shall have a minimum water depth of 2½ feet (762 mm) and a maximum water depth of 4 feet (1219 mm), except that swim spa pools may have a maximum water depth of 5 feet (1524 mm). Depth markers and “NO DIVING” markers are not required on spa-type pools with 200 square feet (19 m²) or less of water surface area.

424.1.8.4 Steps and handrails. Steps or ladders shall be provided and shall be located to provide adequate entrance to and exit from the pool. The number of sets of steps or ladders required shall be on the basis of one for each 75 feet (22 860 mm), or major fraction thereof, of pool perimeter. Step sets for spa type pools with more than 200 square feet of pool water surface area shall comply with Section 424.1.2.5. Step sets for spa-type pools with 200 square feet (19 m²) or less of pool water surface area shall comply with the following: Step treads shall have a minimum width of 10 inches (254 mm) for a minimum continuous tread length of 12 inches (305 mm). Step riser heights shall not exceed 12 inches (305 mm) except when the bottom step is used for a bench or seat, the bottom riser may be a maximum of 14 inches (356 mm). Intermediate treads and risers between the top and bottom treads and risers shall be uniform in width and height, respectively. Contrasting markings on the leading edges of the submerged benches and the intersections of the treads and risers are required to be installed in accordance with Section 424.1.2.5.

424.1.8.4.1 Handrails shall be provided for all sets of steps and shall be anchored in the bottom step and in the deck. Handrails shall be located to provide maximum access to the steps and handrails shall extend 28 inches (711 mm) above the pool deck.

424.1.8.4.2 Where “figure 4” handrails are used, they shall be anchored in the deck and shall extend laterally to any point vertically above the bottom step. Handrails shall be located to provide maximum access to the steps and handrails shall extend 28 inches (711 mm) above the pool deck.

424.1.8.5 Decks. Decks shall have a minimum 4-foot-wide (1219 mm) unobstructed width around the entire pool perimeter except that pools of less than 120 square feet (11 m²) of pool water surface area shall have a minimum 4-foot-wide (1219 mm) unobstructed continuous deck around a minimum of 50 percent of the pool

perimeter. Decks less than 4 feet (1219 mm) wide shall have barriers to prevent their use. Decks shall not be more than 10 inches (254 mm) below the top of the pool.

424.1.8.6 Therapy or jet systems.

424.1.8.6.1 The return lines of spa-type therapy or jet systems shall be independent of the recirculation-filtration and heating systems.

424.1.8.6.2 Therapy or jet pumps shall take suction from the collector tank. Collector tank sizing shall take this additional gallonage into consideration.

424.1.8.7 Filtration system inlets. Spa-type pools with less than 20 feet (6096 mm) of perimeter shall have a minimum of two equally spaced adjustable inlets.

424.1.8.8 Filtration recirculation. Spa-type pools shall have a minimum of one turnover every 30 minutes. The piping, fittings, and hydraulic requirements shall be in accordance with Section 424.1.6.5. All recirculation lines to and from the pool shall be individually valved with proportional flow-type valves in order to control the recirculation flow.

424.1.8.9 Vacuuming. Spa-type pools of over 200 square feet (19 m²) of pool water surface area shall have provisions for vacuuming.

424.1.8.10 Combination spas/pools. When spa pools are part of a conventional swimming pool, the spa pool area shall be offset from the main pool area with the same water depth as the main pool area. The spa pool shall meet all the spa pool requirements of this chapter, and the deck area at the spa shall be protected by connected 30-inch-high (762 mm) stanchions. The deck perimeter at the offset spa area shall not exceed 15 percent of the entire swimming pool perimeter. All benches shall have contrasting markings on the leading edges of the intersection of the bench seats. If tile is used, it shall be slip resistant.

424.1.8.11 Portable and wooden spa pools. Portable and wooden-type spa pools are prohibited.

424.1.9 Water recreation attractions and specialized pools.

424.1.9.1 General. Water recreation attraction projects shall be designed and constructed within the limits of sound engineering practice. In addition to the requirements of this section, compliance is required with Sections 424.1.1 through 424.1.6.5 of this chapter depending upon the pool design and function. Additionally, all pools listed in this section shall have a 3-hour turnover rate unless otherwise noted.

424.1.9.2 Water slides.

424.1.9.2.1 Water slide plunge pool. Plunge pools shall be constructed of concrete or other structurally rigid impervious materials with a nontoxic, smooth and slip resistant finish. The plunge pool design shall meet the criteria of Sections 424.1.9.2.1.1 through 424.1.9.2.1.7.

424.1.9.2.1.1 Plunge pool water depth. The minimum plunge pool operating water depth at the slide flume terminus shall be 3 feet (914 mm). This depth shall be maintained for a minimum distance of 10 feet (3048 mm) in front of the slide terminus from which point the plunge pool floor may have a constant upward slope to allow a minimum water depth of 2 feet (51 mm) at the base of the steps. The floor slope shall not exceed 1 in 10. The plunge pool water depth shall be commensurate with safety and the ease of exit from the plunge pool.

424.1.9.2.1.2 Plunge pool dimension. The plunge pool dimension between any slide flume exit or terminus and the opposite side of the plunge pool shall be a minimum of 20 feet (6096 mm) excluding steps.

424.1.9.2.1.3 Slide flume terminus.

424.1.9.2.1.3.1 The slide flume terminus shall be designed by the design engineer who can demonstrate to the department's satisfaction that riders will be adequately slowed prior to discharge so as to prevent injury or harm to the rider upon impact with the plunge pool water.

424.1.9.2.1.3.2 The minimum distance between any plunge pool side wall and the outer edge of any slide terminus shall be 5 feet (1524 mm). The minimum distance between adjacent slide flumes shall be 6 feet (1828 mm).

424.1.9.2.1.3.3 A minimum length of slide flume of 10 feet (3048 mm) shall be perpendicular to the plunge pool wall at the exit end of the flumes.

424.1.9.2.1.4 Plunge pool main drains. The plunge pool shall have a minimum of one main drain with separate piping and valve to the filtration system collector tank. The velocity through the openings of the main drain grate shall not exceed 1½ feet per second (457 mm/s) at the design flow rate of the recirculation pump. The main drain piping shall be sized to handle 100 percent of the design flow rate of the filtration system with a maximum flow velocity of 3 feet (914 mm) per second.

424.1.9.2.1.5 Plunge pool floor slope. The plunge pool floor shall slope to the main drains and the slope shall not exceed 1 in 10.

424.1.9.2.1.6 Plunge pool decks.

424.1.9.2.1.6.1 Width. The minimum width of plunge pool decks along the exit side shall be 10 feet (3048 mm). There shall be a pool deck along the side opposite the plunge pool weir, and this deck shall have a minimum width of 4 feet (1219 mm).

424.1.9.2.1.6.2 Curbs. All plunge pool decks shall have a minimum 6-inch-high (152 mm) curb or adequate freeboard to contain the water

surge generated by the person entering the water via the slide.

424.1.9.2.1.6.3 Slopes. All plunge pool decks shall slope away from the plunge pool unless the curb is located at the outside perimeter of the deck. If the curb is located at the outside perimeter of the deck, the plunge pool deck shall slope to the plunge pool or pump reservoir or to deck drains which discharge to waste. All slopes shall be between 2- and 4-percent grade.

424.1.9.2.1.7 Hand holds. Hand holds shall be provided along the sides of the plunge pool in areas where the water depth exceeds 3 feet (914 mm), except that no hand holds shall be required along the wall where the slide enters the pool nor shall they be required at the pool exit.

424.1.9.2.2 Run out lanes.

424.1.9.2.2.1 Run out lanes may be utilized in lieu of a plunge pool system, provided they are constructed to the slide manufacturers specifications and are approved by the design engineer of record.

424.1.9.2.2.2 Eight-foot-wide (2438 mm) walkways shall be provided adjacent to run out lanes.

424.1.9.2.2.3 Minimum water level indicator markings shall be provided on both sides of the run out trough to ensure adequate water for the safe slowing of pool patrons.

424.1.9.2.2.4 Water park personnel shall be provided at the top of the slides and at the run out.

424.1.9.2.3 Pump reservoirs. Pump reservoirs shall be made of concrete or other impervious material with a smooth slip-resistant finish and shall be connected to the plunge pool by a weir. Pump reservoirs shall be for the slide pump intakes. Pump reservoir designs shall meet the criteria of Sections 424.1.9.2.3.1 through 424.1.9.2.3.5.

424.1.9.2.3.1 Pump reservoir volume. The minimum reservoir volume shall be equal to 2 minutes of the combined flow rate in gallons per minute of all filter and slide pumps.

424.1.9.2.3.2 Pump reservoir security. Pump reservoirs shall be accessible only to authorized individuals.

424.1.9.2.3.3 Pump reservoir maintenance accessibility. Access decks shall be provided for the reservoir such that all areas are accessible for vacuuming, skimming, and maintenance. The decks shall have a minimum width of 3 feet (914 mm) and shall have a minimum slope of 3:10 away from the reservoir.

424.1.9.2.3.4 Pump reservoir slide pump intakes. The slide pump intakes shall be located in the pump reservoir and shall be designed to allow cleaning without danger of operator entrapment.

424.1.9.2.3.5 Pump reservoir main drains. The pump reservoir shall have a minimum of one main drain with separate piping and valve to the filtration system collector tank and the velocity through the openings of the main drain grates shall not exceed 1½ feet per second (457 mm/s) at the design flow rate of the filtration system pump. The main drain piping shall be sized to handle 100 percent of design flow rate of the filtration system pump with a maximum flow velocity of 3 feet per second (914 mm/s).

424.1.9.2.4 Slide pump check valves. Slide pumps shall have check valves on all discharge lines.

424.1.9.2.5 Perimeter overflow gutters or skimmers. Plunge pools and pump reservoirs shall have perimeter overflow gutter system or skimmer which shall be an integral part of the filtration system.

424.1.9.2.5.1 Perimeter overflow gutter systems. Perimeter overflow gutter systems shall meet the requirements of Section 424.1.6.5.3.1 except that gutters are not required directly under slide flumes or along the weirs which separate plunge pools and pump reservoirs.

424.1.9.2.5.2 Surface skimmers. Surface skimmers may be used in lieu of perimeter overflow gutters and shall be appropriately spaced and located according to the structural design. Unless an overflow gutter system is used, surface skimmers shall be provided in the plunge pool and in the pump reservoir and the skimmer system shall be designed to carry 60 percent of the filtration system design flow rate with each skimmer carrying a minimum 30 gpm (2 L/s). All surface skimmers shall meet the requirements for NSF commercial approval as set forth in NSF 50, *Circulation System Components and Related Materials for Swimming Pools, Spas/Hot Tubs*, which is incorporated by reference in these rules, including an equalizer valve in the skimmer and an equalizer line to the pool wall on systems with direct connection to pump suction.

424.1.9.2.6 Water slide recirculation–filtration equipment.

424.1.9.2.6.1 Recirculation rate. The recirculation-filtration system of water slides shall recirculate and filter a water volume equal to the total water volume of the facility in a period of 3 hours or less.

424.1.9.2.6.2 Filter areas. minimum filter area requirements shall be twice the filter areas specified for the recirculation rates stipulated in Section 424.1.6.5.5.1. The filtration system shall be capable of returning the pool water turbidity to 5/10 NTU within 8 hours or less after peak bather load.

424.1.9.2.6.3 Hair and lint strainer. Any filtration system pump which takes suction directly from the plunge pool and reservoir shall have a

minimum 8-inch (208 mm) diameter hair and lint strainer on the suction side of the pump.

424.1.9.2.7 Disinfection. The disinfection equipment shall be capable of feeding 12 mg/L of halogen to the continuous recirculation flow of the filtration system.

424.1.9.3 Water activity pools.

424.1.9.3.1 Water activity pools shall be designed and constructed within the limits of sound engineering practice. The design engineer may consult with the department prior to preparation and submission of engineering plans and specifications for water activity pools.

424.1.9.3.2 Water activity pools shall be constructed of concrete or other structurally rigid impervious materials with a nontoxic, smooth and slip-resistant finish. These pools shall be of such shape and design as to be operated and maintained in a safe and sanitary manner.

424.1.9.3.3 The recirculation-filtration system of water activity pools shall be capable of a minimum of one turnover every 3 hours.

424.1.9.4 Wave pools.

424.1.9.4.1 Wave pools shall be designed and constructed within the limits of sound engineering practice.

424.1.9.4.2 Wave pools shall be constructed of concrete or other impervious materials with a smooth slip-resistant finish. These pools shall be of such shape and design as to be operated and maintained in a safe and sanitary manner.

424.1.9.4.3 The recirculation-filtration system of wave pools shall be capable of a minimum of one turnover every 3 hours.

424.1.9.5 Lazy river rides.

424.1.9.5.1 Lazy river rides shall be constructed within the limits of sound engineering practice.

424.1.9.5.2 Lazy river rides shall be constructed on concrete or other impervious materials with a nontoxic, smooth and slip-resistant finish. These rides shall be of such shape and design as to be operated in a safe and sanitary manner.

424.1.9.5.3 The recirculation-filtration system of the lazy river ride shall be capable of a minimum of one turnover every 3 hours.

424.1.9.5.4 The maximum water depth of the lazy river ride shall not exceed 3 feet (914 mm) unless justified to the department's satisfaction by the design engineer.

424.1.9.5.5 Decking shall be provided at the entrance and exit points as necessary to provide safe patron access but shall not be smaller than 10 feet (3048 mm) in width and length. Additional decking along the ride course is not required except that decking shall be required at lifeguard locations and emergency exit points.

424.1.9.5.6 Access and exit shall be provided at the start and end of the ride only, except that emergency exit locations shall be located along the ride course as necessary to provide for the safety of the patrons.

424.1.9.6 Zero depth entry pools.

424.1.9.6.1 Zero depth entry pools shall have a continuous floor slope from the water edge to the deep end.

424.1.9.6.2 The deck level perimeter overflow system with grate shall be provided at the waters edge across the entire zero depth portion of the pool.

424.1.9.6.3 The pool deck may slope toward the pool for no more than 5 feet (1524 mm), as measured from the overflow system grate outward. Beyond this area the deck shall slope away from the pool in accordance with Section 424.1.2.2.3.

424.1.9.6.4 Barriers and no-entry signs shall be provided along the pool wall edge where the water depth is less than 3 feet (914 mm) deep. No-entry signs shall be slip-resistant, shall have 4-inch-high (102 mm) letters, shall be located within 2 feet (610 mm) of the pool edge and shall be spaced no more than 15 feet (4572 mm) apart.

424.1.9.6.5 Additional inlets shall be provided in areas of less than 18 inches (457 mm) deep. The numbers and location shall be such as to double the flow rate into this area.

424.1.9.7 Special purpose pools.

424.1.9.7.1 General. Special purpose pool projects may deviate from the requirements of other sections of these rules provided the design and construction are within the limits of sound engineering practice. Only those deviations necessary to accommodate the special usage shall be allowed and all other aspects of the pool shall comply with the requirements of this section and with Section 424.1.2.

424.1.9.7.2 A special purpose pool may incorporate ledges which do not overhang into the pool.

424.1.9.8 Interactive water features.

424.1.9.8.1 Waters discharged from all fountain or spray features shall not pond on the feature floor but shall flow by gravity through a main drain fitting to a below grade sump or collection system which discharges to a collector tank. The minimum size of the sump or collector tank shall be equal to the volume of 2 minutes of the combined flow of all feature pumps and the filter pump. Smaller tanks may be utilized if hydraulically justified by the design engineer. Adequate access shall be provided to the sump or collector tank. Stairs or a ladder shall be provided as needed to ensure safe entry into the tank.

424.1.9.8.2 When an underground sump is utilized, an automatic skimmer system shall be provided. A variable height skimmer may be used or a custom surface skimmer device may be substituted if deemed appropriate by both the design engineer and the department.

424.1.9.8.3 Chemical feeders shall be provided in accordance with Section 424.1.6.5; except that the disinfection feeder shall be capable of feeding 12 ppm of free chlorine to the filter return piping.

424.1.9.8.4 If night operation is proposed, 6 footcandles (60 lux) of light shall be provided on the pool deck and the water feature area. Lighting that may be exposed to the feature pool water shall not exceed 15 volts, shall be installed in accordance with manufacturer's specifications and be approved for such use by UL or NSF.

424.1.9.8.5 All electrical work shall comply with Chapter 27 of the *Florida Building Code, Building*.

424.1.9.8.6 Hydraulics.

424.1.9.8.6.1 The filter system shall be capable of filtering and treating the entire water volume of the water feature within 30 minutes. The filter system shall draft from the collector tank and return filtered and treated water to the tank via equally spaced inlet fittings. The flow rate through these fittings shall not exceed 20 gpm (1.3 L/s).

424.1.9.8.6.2 The water feature pump shall draft from the collector tank.

424.1.9.8.6.3 An automatic water level controller shall be provided.

424.1.9.8.6.4 The flow rate through the feature nozzles of the water features shall be such as not to harm the patrons and shall not exceed 20 feet per second (6096 mm/s) unless justified by the design engineer and by the fountain system manufacturer.

424.2 Private swimming pools.

424.2.1 Definitions—general.

424.2.1.1 Tense, gender and number. For the purpose of this code, certain abbreviations, terms, phrases, words, and their derivatives shall be construed as set forth in this section. Words used in the present tense include the future. Words in the masculine gender include the feminine and neuter. Words in the feminine and neuter gender include the masculine. The singular number includes the plural and the plural number includes the singular.

424.2.1.2 Words not defined. Words not defined herein shall have the meanings stated in the *Florida Building Code, Building*; *Florida Building Code, Mechanical*; *Florida Building Code, Plumbing*; *Florida Building Code, Fuel Gas*; or *Florida Fire Prevention Code*. Words not defined in the *Florida Building Code* shall have the meanings stated in the *Webster's Ninth New Collegiate Dictionary*, as revised.

424.2.2 Definitions.

ABOVE-GROUND/ON-GROUND POOL. See "Swimming pool."

ADMINISTRATIVE AUTHORITY. The individual official, board, department or agency established and authorized by a state, county, city or other political subdivision

created by law to administer and enforce the provisions of the swimming pool code as adopted or amended.

APPROVED. Accepted or acceptable under an applicable specification stated or cited in this code, or accepted as suitable for the proposed use under procedures and power of the administrative authority.

APPROVED SAFETY COVER. A manually or power-applied safety pool cover that meets all of the performance standards of ASTM International in compliance with ASTM F 1346.

APPROVED TESTING AGENCY. An organization primarily established for the purpose of testing to approved standards and approved by the administrative authority.

BACKWASH PIPING. See "Filter waste discharge piping."

BARRIER. A fence, dwelling wall or nondwelling wall or any combination thereof which completely surrounds the swimming pool and obstructs access to the swimming pool, especially access from the residence or from the yard outside the barrier.

BODY FEED. Filter aid fed into a diatomite-type filter throughout the filtering cycle.

CARTRIDGE FILTER. A filter using cartridge type filter elements.

CHEMICAL PIPING. Piping which conveys concentrated chemical solutions from a feeding apparatus to the circulation piping.

CIRCULATION PIPING SYSTEM. Piping between the pool structure and the mechanical equipment. Usually includes suction piping, face piping and return piping.

COMBINATION VALVE. A multipart valve intended to perform more than one function.

DESIGN HEAD. Total head requirement of the circulation system at the design rate of flow.

DIATOIMTE (DIATOAMCEOUS EARTH). A type of filter aid.

DIATOIMTE TYPE FILTER. A filter designed to be used with filter aid.

DIRECT ACCESS FROM THE HOME. Any opening which discharges into the "perimeter" of the pool or any opening in an exterior dwelling wall, or interior wall (for indoor pools) which faces the pool.

EXIT ALARM. A device that makes audible, continuous alarm sounds when any door or window which permits access from the residence to any pool that is without an intervening enclosure is opened or left ajar.

FACE PIPING. Piping, with all valves and fittings, which is used to connect the filter system together as a unit.

FILTER. Any apparatus by which water is clarified.

FILTER AID. A nonpermanent type of filter medium or aid such as diatomite, alum, etc.

FILTER CARTRIDGE. A disposable or renewable filter element which generally employs no filter aid.

FILTER ELEMENT. That part of a filter which retains the filter medium.

FILTER MEDIUM. Fine material which entraps the suspended particles and removes them from the water.

FILTER RATE. Average rate of flow per square foot of filter area.

FILTER ROCK. Specially graded rock and gravel used to support filter sand.

FILTER SAND. A specially graded type of permanent filter medium.

FILTER SEPTUM. That part of the filter element in a diatomite type filter upon which a cake of diatomite or other nonpermanent filter aid may be deposited.

FILTER WASTE DISCHARGE PIPING. Piping that conducts waste water from a filter to a drainage system. Connection to drainage system is made through an air gap or other approved methods.

FRESH WATER. Those waters having a specific conductivity less than a solution containing 6,000 ppm of sodium chloride.

HIGH RATE SAND FILTER. A sand filter designed for flows in excess of 5 gpm (.3 L/s) per square foot.

HOT TUB. See “Swimming pool.”

INGROUND POOL. See “Swimming pool.”

INLET FITTING. Fitting or fixture through which circulated water enters the pool.

MAIN SUCTION OUTLET. Outlet at the deep portion of the pool through which the main flow of water leaves the pool when being drained or circulated.

MESH SAFETY BARRIER. A combination of materials, including fabric, posts, and other hardware to form a barrier around a swimming pool.

MEDICALLY FRAIL ELDERLY PERSON. Means any person who is at least 65 years of age and has a medical problem that affects balance, vision, or judgment, including but not limited to a heart condition, diabetes, or Alzheimer’s disease or any related disorder.

POOL. See “Swimming pool.”

POOL DEPTHS. The distance between the floor of pool and the maximum operating water level.

POOL PERIMETER. A pool perimeter is defined by the limits of the pool deck, its surrounding area including yard area on same property, and any dwelling or nondwelling wall or any combination thereof which completely surrounds the pool.

POOL PLUMBING. All chemical, circulation, filter waste discharge piping, deck drainage and water filling system.

PORTABLE POOL. A prefabricated pool which may be erected at the point of intended use and which may be subsequently disassembled and reerected at a new location. Generally installed on the surface of the ground and without excavation.

PRECOAT. In a diatomite-type filter, the initial coating or filter aid placed on the filter septum at the start of the filter cycle.

RAPID SAND FILTER. A filter designed to be used with sand as the filter medium and for flows not to exceed 5 gpm (.3 L/s) per square foot.

RECEPTOR. An approved plumbing fixture or device of such material, shape and capacity as to adequately receive the discharge from indirect waste piping, so constructed and located as to be readily cleaned.

RESIDENTIAL. Situated on the premises of a detached one- or two-family dwelling or a one-family townhouse not more than three stories high.

RETURN PIPING. That portion of the circulation piping which extends from the outlet side of the filters to the pool.

SALINE WATER. Those waters having a specific conductivity in excess of a solution containing 6,000 ppm of sodium chloride.

SEPARATION TANK. A device used to clarify filter rinse or waste water; sometimes called a “reclamation tank.”

SKIM FILTER. A surface skimmer combined with a vacuum diatomite filter.

SPA, NONPORTABLE. See “Swimming pool.”

SPA, PORTABLE. Nonpermanent structure intended for recreational bathing, in which all controls and water heating and water circulating equipment are an integral part of the product and which is cord-connected and not permanently electrically wired.

SUCTION PIPING. That portion of the circulation piping located between the pool structure and the inlet side of the pump and usually includes main outlet piping, skimmer piping, vacuum piping and surge tank piping.

SURFACE SKIMMER. A device generally located in the pool wall which skims the pool surface by drawing pool water over a self-adjusting weir.

SWIMMING POOL, PRIVATE. Any structure, located in a residential area, that is intended for swimming or recreational bathing and contains water over 24 inches (610 mm) deep including but not limited to inground, aboveground, and onground swimming pools, hot tubs, and nonportable spas.

SWIMMING POOL, INDOOR. A swimming pool which is totally contained within a structure and surrounded on all four sides by walls of said structure.

SWIMMING POOL, OUTDOOR. Any swimming pool which is not an indoor pool.

SWIMMING POOL, PUBLIC. A watertight structure of concrete, masonry, fiberglass, stainless steel or plastic which is located either indoors or outdoors, used for bathing or swimming by humans, and filled with a filtered and disinfected water supply, together with buildings, appurtenances and equipment used in connection therewith. A public swimming pool or public pool shall mean a conventional pool, spa-type pool, wading pool, special purpose pool or water recreation attraction, to which admission may be

gained with or without payment of a fee and includes, pools operated by or serving camps, churches, cities, counties, day care centers, group home facilities for eight or more clients, health spas, institutions, parks, state agencies, schools, subdivisions; or the cooperative living-type projects of five or more living units, such as apartments, boarding houses, hotels, mobile home parks, motels, recreational vehicle parks and townhouses.

SWIMMING POOL, RESIDENTIAL. See “Swimming pool, private.”

TURNOVER TIME. The time in hours required for the circulation system to filter and recirculate a volume of water equal to the pool volume.

VACUUM FITTING. A fitting in the pool which is used as a convenient outlet for connecting the underwater suction cleaning equipment.

VACUUM PIPING. The piping from the suction side of a pump connected to a vacuum fitting located at the pool and below the water level.

WASTE PIPING. See “Filter waste discharge piping.”

WIDTH AND/OR LENGTH. Actual water dimension taken from wall to wall at the maximum operating water level.

YOUNG CHILD. Any person under the age of 6 years.

424.2.3 Mechanical requirements. Unless otherwise specified in this code, all piping, equipment and materials used in the process piping system of swimming pools that are built in place shall conform to the *Florida Building Code, Plumbing*.

424.2.4 Approvals.

424.2.4.1 Compliance. All materials, piping, valves, equipment or appliances entering into the construction of swimming pools or portions thereof shall be of a type complying with this code or of a type recommended and approved by a nationally recognized testing agency or conforming to other recognized standards acceptable to the administrative authority.

424.2.4.2 Items not covered. For any items not specifically covered in these requirements, the administrative authority is hereby authorized to require that all equipment, materials, methods of construction and design features shall be proven to function adequately, effectively and without excessive maintenance and operational difficulties.

424.2.4.3 Applicant responsibility. It shall be the responsibility of the applicant to provide such data, tests or other adequate proof that the device, material or product will satisfactorily perform the function for which it is intended, before such item shall be approved or accepted for tests.

424.2.5 Alternate materials and methods of construction.

424.2.5.1 Approval and authorization. The provisions of this code are not intended to prevent the use of any alternate material, method of construction, appliance or equipment, provided any such alternate has been first

approved and its use authorized by the administrative authority.

424.2.5.2 Required tests. When there is insufficient evidence to substantiate claims for alternates, the administrative authority may require tests, as proof of compliance, to be made by an approved agency at the expense of the applicant.

424.2.6 Private swimming pools.

424.2.6.1 Conformance standard. Design, construction and workmanship shall be in conformity with the requirements of ANSI/NSPI 3, ANSI/NSPI 4, ANSI/NSPI 5, ANSI/NSPI 6, and ANSI/APSP 7.

424.2.6.2 Required equipment. Every swimming pool shall be equipped complete with approved mechanical equipment consisting of filter, pump, piping valves and component parts.

Exception: Pools with a supply of fresh water equivalent to the volume of the pool in the specified turnover time will be allowed.

424.2.6.3 Water velocity. Pool piping shall be designed so the water velocity will not exceed 10 feet per second (mm/s) for pressure piping and 8 feet per second (mm/s) for suction piping, except that the water velocity shall not exceed 8 feet per second (3048 mm/s) in copper tubing. Main suction outlet velocity must comply with ANSI/APSP 7.

Exception: Jet inlet fittings shall not be deemed subject to this requirement.

424.2.6.4 Piping to heater. Water flow through the heater, any bypass plumbing installed, any back-siphoning protection, and the use of heat sinks shall be done in accordance with the manufacturer’s recommendations.

424.2.6.5 Piping installation. All piping materials shall be installed in strict accordance with the manufacturer’s installation standards.

Exception: Primer and glue on exposed above-ground piping not required to be colored.

424.2.6.6 Entrapment protection for suction outlets shall be installed in accordance with requirements of ANSI/APSP 7.

424.2.7 Pumps.

424.2.7.1 Strainer. Pool circulating pumps shall be equipped on the inlet side with an approved type hair and lint strainer when used with a pressure filter.

424.2.7.2 Installation. Pumps shall be installed in accordance with manufacturer recommendations.

424.2.7.3 Capacity. Pumps shall have design capacity at the following heads.

1. Pressure diatomaceous earth—At least 60 feet (18 288 mm).
2. Vacuum D.E.—20-inch (508 mm) vacuum on the suction side and 40 feet (1219 mm) total head.
3. Rapid sand—At least 45 feet (13 716 mm).

4. High rate sand—At least 60 feet (18 288 mm).

424.2.7.4 Materials. Pump impellers, shafts, wear rings and other working parts shall be of corrosion-resistant materials.

424.2.8 Valves.

424.2.8.1 General. Valves shall be made of materials that are approved in the *Florida Building Code, Plumbing*. Valves located under concrete slabs shall be set in a pit having a least dimension of five pipe diams with a minimum of at least 10 inches (254 mm) and fitted with a suitable cover. All valves shall be located where they will be readily accessible for maintenance and removal.

424.2.8.2 Full-way (gate) valves. Full-way valves shall be installed to insure proper functioning of the filtration and piping system. When the pump is located below the overflow rim of the pool, a valve shall be installed on the discharge outlet and the suction line.

424.2.8.3 Check valves. Where check valves are installed they shall be of the swing, spring or vertical check patterns.

424.2.8.4 Combination valves. Combination valves shall be installed per the manufacturer's installation instructions.

424.2.9 Water supply. Unless an approved type of filling system is installed, any water supply which in the judgment of the administrative authority may be used to fill the pool, shall be equipped with backflow protection. No over the rim fill spout shall be accepted unless located under a diving board, or properly guarded.

424.2.10 Waste water disposal.

424.2.10.1 Connection limitations. Direct or indirect connections shall not be made between any storm drain, sewer, drainage system, seepage pit underground leaching pit, or subsoil drainage line, and any line connected to a swimming pool unless approved by the administrative authority.

424.2.10.2 Disposal through public sewer. When the waste water from a swimming pool is to be disposed of through a public sewer, a 3-inch (76 mm) P-trap shall be installed on the lower terminus of the building drain and the tall piece from the trap shall extend a minimum of 3 inches (76 mm) above finished grade and below finished floor grade. This trap need not be vented. The connection between the filter waste discharge piping and the P-trap shall be made by means of an indirect connection.

424.2.10.3 Deviations. Plans and specifications for any deviation from the above manner of installation shall first be approved by the administrative authority before any portion of any such system is installed. When waste water disposal is to seepage pit installation, it shall be installed in accordance with the approval granted by the administrative authority.

424.2.11 Separation tank. A separation tank of an approved type may be used in lieu of the aforementioned means of waste water disposal when connected as a reclamation system.

424.2.12 Tests.

424.2.12.1 Pressure test. All pool piping shall be tested and proved tight to the satisfaction of the administrative authority, under a static water or air pressure test of not less than 35 psi (241 kPa) for 15 minutes.

Exception: Circulating pumps need not be tested as required in this section.

424.2.12.2 Drain and waste piping. All drain and waste piping shall be tested by filling with water to the point of overflow and all joints shall be tight.

424.2.13 Drain piping.

424.2.13.1 Slope to discharge. Drain piping serving gravity overflow gutter drains and deck drains shall be installed to provide continuous grade to point of discharge.

424.2.13.2 Joints and connections. Joints and connections shall be made as required by the *Florida Building Code, Plumbing*.

424.2.14 Water heating equipment.

424.2.14.1 Labels. Swimming pool water heating equipment shall conform to the design, construction and installation requirements in accordance with accepted engineering practices and shall bear the label of a recognized testing agency, and shall include a consideration of combustion air, venting and gas supply requirements for water heaters.

424.2.14.2 Water retention. If a heater is not equipped or designed for an approved permanent bypass or antisiphon device, an approved permanent bypass or antisiphon device shall be installed to provide a positive means of retaining water in the heater when the pump is not in operation.

424.2.14.3 Pit drainage. When the heater is installed in a pit, the pit shall be provided with approved drainage facilities.

424.2.14.4 Connections. All water heating equipment shall be installed with flanges or union connection adjacent to the heater.

424.2.14.5 Relief valve. When water heating equipment which is installed in a closed system has a valve between the appliance and the pool, a pressure relief valve shall be installed on the discharge side of the water heating equipment. For units up to and including 200,000 Btu/hour input, the relief valve shall be rated by the American Gas Association.

424.2.15 Gas piping. Gas piping shall comply with the *Florida Building Code, Fuel Gas*.

424.2.16 Electrical. Electrical wiring and equipment shall comply with Chapter 27 of the *Florida Building Code, Building*.

424.2.17 Residential swimming barrier requirement. Residential swimming pools shall comply with Sections 424.2.17.1 through 424.2.17.3.

Exception: A swimming pool with an approved safety pool cover complying with ASTM F 1346.

424.2.17.1 Outdoor swimming pools. Outdoor swimming pools shall be provided with a barrier complying with Sections 424.2.17.1.1 through 424.2.17.1.14.

424.2.17.1.1 The top of the barrier shall be at least 48 inches (1219 mm) above grade measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. Where the top of the pool structure is above grade the barrier may be at ground level or mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm).

424.2.17.1.2 The barrier may not have any gaps, openings, indentations, protrusions, or structural components that could allow a young child to crawl under, squeeze through, or climb over the barrier as herein described below. One end of a removable child barrier shall not be removable without the aid of tools. Openings in any barrier shall not allow passage of a 4-inch diameter (102 mm) sphere.

424.2.17.1.3 Solid barriers which do not have openings shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.

424.2.17.1.4 Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical members shall not exceed 1¾ inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1¾ inches (44 mm) in width.

424.2.17.1.5 Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1¾ inches (44 mm) in width.

424.2.17.1.6 Maximum mesh size for chain link fences shall be a 2¼ inch (57 mm) square unless the fence is provided with slats fastened at the top or bottom which reduce the openings to no more than 1¾ inches (44 mm).

424.2.17.1.7 Where the barrier is composed of diagonal members, the maximum opening formed by the diagonal members shall be no more than 1¾ inches (44 mm).

424.2.17.1.8 Access gates, when provided, shall be self-closing and shall comply with the requirements of Sections 424.2.17.1.1 through 424.2.17.1.7 and shall be equipped with a self-latching locking device located on the pool side of the gate. Where the device release is located no less than 54 inches (1372 mm) from the bottom of the gate, the device release mechanism may be located on either side of the gate and so placed that it cannot be reached by a young child over the top or through any opening or gap from the outside. Gates that provide access to the swimming pool must open outward away from the pool. The gates and barrier shall have no opening greater than ½ inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.

424.2.17.1.9 Where a wall of a dwelling serves as part of the barrier, one of the following shall apply:

1. All doors and windows providing direct access from the home to the pool shall be equipped with an exit alarm complying with UL 2017 that has a minimum sound pressure rating of 85 dB A at 10 feet (3048 mm). The exit alarm shall produce a continuous audible warning when the door and its screen are opened. The alarm shall sound immediately after the door is opened and be capable of being heard throughout the house during normal household activities. The alarm shall be equipped with a manual means to temporarily deactivate the alarm for a single opening. Such deactivation shall last no more than 15 seconds. The deactivation switch shall be located at least 54 inches (1372 mm) above the threshold of the door. Separate alarms are not required for each door or window if sensors wired to a central alarm sound when contact is broken at any opening.

Exceptions:

- a. Screened or protected windows having a bottom sill height of 48 inches (1219 mm) or more measured from the interior finished floor at the pool access level.
 - b. Windows facing the pool on floor above the first story.
 - c. Screened or protected pass-through kitchen windows 42 inches (1067 mm) or higher with a counter beneath.
2. All doors providing direct access from the home to the pool must be equipped with a self-closing, self-latching device with positive mechanical latching/locking installed a minimum of 54 inches (1372 mm) above the threshold, which is approved by the authority having jurisdiction.

424.2.17.1.10 Where an above-ground pool structure is used as a barrier or where the barrier is mounted on

top of the pool structure, and the means of access is a ladder or steps, the ladder or steps either shall be capable of being secured, locked or removed to prevent access, or the ladder or steps shall be surrounded by a barrier which meets the requirements of Sections 424.2.17.1.1 through 424.2.17.1.9 and Sections 424.2.17.1.12 through 424.2.17.1.14. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch-diameter (102 mm) sphere.

424.2.17.1.11 Standard screen enclosures which meet the requirements of Section 424.2.17 may be utilized as part of or all of the “barrier” and shall be considered a “nondwelling” wall. Removable child barriers shall have one end of the barrier nonremovable without the aid of tools.

424.2.17.1.12 The barrier must be placed around the perimeter of the pool and must be separate from any fence, wall, or other enclosure surrounding the yard unless the fence, wall, or other enclosure or portion thereof is situated on the perimeter of the pool, is being used as part of the barrier, and meets the barrier requirements of this section.

424.2.17.1.13 Removable child barriers must be placed sufficiently away from the water’s edge to prevent a young child or medically frail elderly person who may manage to penetrate the barrier from immediately falling into the water. Sufficiently away from the water’s edge shall mean no less than 20 inches (508 mm) from the barrier to the water’s edge. Dwelling or nondwelling walls including screen enclosures, when used as part or all of the barrier and meeting the other barrier requirements, may be as close to the water’s edge as permitted by this code.

424.2.17.1.14 A wall of a dwelling may serve as part of the barrier if it does not contain any door or window that opens to provide direct access from the home to the swimming pool.

424.2.17.1.15 A mesh safety barrier meeting the requirements of Section 424.2.17 and the following minimum requirements shall be considered a barrier as defined in this section:

1. Individual component vertical support posts shall be capable of resisting a minimum of 52 pounds (24 kg) of horizontal force prior to breakage when measured at a 36 inch (914 mm) height above grade. Vertical posts of the child safety barrier shall extend a minimum of 3 inches (76 mm) below deck level and shall be spaced no greater than 36 inches (914 mm) apart.
2. The mesh utilized in the barrier shall have a minimum tensile strength according to ASTM D 5034 of 100 lbf, and a minimum ball burst strength according to ASTM D 3787 of 150 lbf. The mesh shall not be capable of deformation such that a $\frac{1}{4}$ -inch (6.4 mm) round object could

not pass through the mesh. The mesh shall receive a descriptive performance rating of no less than “trace discoloration” or “slight discoloration” when tested according to ASTM G 53, *Weatherability, 1,200 hours*.

3. When using a molding strip to attach the mesh to the vertical posts, this strip shall contain, at a minimum, #8 by $\frac{1}{2}$ inch (12.7 mm) screws with a minimum of two screws at the top and two at the bottom with the remaining screws spaced a maximum of 6 inches (152 mm) apart on center.
4. Patio deck sleeves (vertical post receptacles) placed inside the patio surface shall be of a nonconductive material.
5. A latching device shall attach each barrier section at a height no lower than 45 inches (1143 mm) above grade. Common latching devices that include, but are not limited to, devices that provide the security equal to or greater than that of a hook-and-eye-type latch incorporating a spring actuated retaining lever (commonly referred to as a safety gate hook).
6. The bottom of the mesh safety barrier shall not be more than 1 inch (25 mm) above the deck or installed surface (grade).

424.2.17.1.16 Adjacent waterways. Permanent natural or permanent man-made features such as bulkheads, canals, lakes, navigable waterways, etc., adjacent to a public or private swimming pool or spa may be permitted as a barrier when approved by the authority having jurisdiction. When evaluating such barrier features, the authority may perform on-site inspections and review evidence such as surveys, aerial photographs, water management agency standards and specifications, and any other similar documentation to verify, at a minimum, the following:

1. The barrier feature is not subject to natural changes, deviations, or alterations and is capable of providing an equivalent level of protection as that provided by the code.
2. The barrier feature clearly impedes, prohibits or restricts access to the swimming pool or spa.

424.2.17.2 Indoor swimming pools. All walls surrounding indoor swimming pools shall comply with Section 424.2.17.1.9.

424.2.17.3 Prohibited locations. A barrier may not be located in a way that allows any permanent structure, equipment, or window that opens to provide access from the home to the swimming pool.

424.2.18 Ladders and steps. All pools whether public or private shall be provided with a ladder or steps in the shallow end where water depth exceeds 24 inches (610 mm). In private pools where water depth exceeds 5 feet (1524 mm) there shall be ladders, stairs or underwater benches/swim-outs in the deep end. Where manufactured diving

equipment is to be used, benches or swim-outs shall be recessed or located in a corner.

Exception: In private pools having more than one shallow end, only one set of steps are required. A bench, swimout or ladder may be used at all additional shallow ends in lieu of an additional set of steps.

424.2.19 Final inspection. Final electrical, and barrier code, inspection shall be completed prior to filling the pool with water.

Exception: Vinyl liner and fiberglass pools are required to be filled with water upon installation.

424.2.20 Filters. Components shall have sufficient capacity to provide a complete turnover of pool water in 12 hours or less.

424.2.20.1 Sand filters.

424.2.20.1.1 Approved types. Rapid sand filters [flow up to 5 gpm per square foot (.3L/s)] shall be constructed in accordance with approved standards. Where high rate sand filters [flow in excess of 5 gpm per square foot (.3 L/s)] are used, they shall be of an approved type. The circulation system and backwash piping shall be adequate for proper backwashing of said filter and shall provide backwash flow rates of at least 12 gpm per square foot (.8 L/s) or rapid sand filters or 15 gpm per square foot (.9 L/s) for high rate sand filters.

424.2.20.1.2 Instructions. Every filter system shall be provided with written operating instructions.

424.2.20.1.3 Filter system equipment. On pressure-type filters, a means shall be provided to permit the release of internal pressure. A filter incorporating an automatic internal air release as its principal means of air release shall have lids which provide a slow and safe release of pressure as part of its design. A separation tank used in conjunction with a filter tank shall have as part of its design a manual means of air release or a lid which provides a slow and safe release of pressure as it is opened.

424.2.20.2 Diatomite type filters.

424.2.20.2.1 Design. Diatomite-type filters shall be designed for operation under either pressure or vacuum. The design capacity for both pressure and vacuum filters shall not exceed 2 gpm per square foot (.13 L/s) of effective filter area.

424.2.20.2.2 Filter aid. Provision shall be made to introduce filter aid into the filter in such a way as to evenly precoat the filter septum.

424.2.21 Pool fittings.

424.2.21.1 Approved type. Pool fittings shall be of an approved type and design as to be appropriate for the specific application.

424.2.21.2 Skimmers. Approved surface skimmers are required and shall be installed in strict accordance with the manufacturer's installation instructions. Skimmers shall be installed on the basis of one per 800 square feet (74 m²) of surface area or fraction thereof, and shall be

designed for a flow rate of at least 25 gpm (94L/m) per skimmer.

424.2.21.3 main outlet. An approved main outlet, when provided, shall be located on a wall or floor at or near the deepest point in the pool for emptying or circulation, or both, of the water in the pool.

424.2.21.4 Hydrostatic relief device. In areas of anticipated water table an approved hydrostatic relief device shall be installed.

Exception: Plastic liner pools (where there is no structural bottom to the pool).

424.2.21.5 Inlet fittings. Approved manufactured inlet fittings for the return of recirculated pool water shall be provided on the basis of at least one per 300 square feet (28 m²) of surface area. Such inlet fittings shall be designed and constructed to insure an adequate seal to the pool structure and shall incorporate a convenient means of sealing for pressure testing of the pool circulation piping. Where more than one inlet is required, the shortest distance between any two required inlets shall be at least 10 feet (3048 mm).

424.2.22 Equipment foundations and enclosures. All pool motors and equipment shall be installed in compliance with the manufacturer's recommendations. All heating and electrical equipment, unless approved for outdoor installation, shall be adequately protected against the weather or installed within a building.

424.2.23 Accessibility and clearances. Equipment shall be so installed as to provide ready accessibility for cleaning, operating, maintenance and servicing.

SECTION 425

PUBLIC LODGING ESTABLISHMENTS

425.1 Scope. Public lodging establishments shall comply with the following design and construction standards.

Note: Other administrative and programmatic provisions may apply. See Department of Business and Professional Regulations (DBPR) Rules 61C-1 and 61C-3, *Florida Administrative Code* and Chapter 509, *Florida Statutes*.

425.2 Definitions.

PUBLIC LODGING ESTABLISHMENT. See Section 509.013, *Florida Statutes*.

425.3 General sanitation and safety requirements. The following general requirements and standards shall be met by all public lodging establishments:

425.3.1 Water, plumbing and waste. Except as specifically provided in this code, standards for water, plumbing and waste shall be governed by Chapter 5 of 1999 Food Code and Chapter 509 Part I, *Florida Statutes*. For the purposes of this section, the term "food establishment" as referenced in the Food Code shall apply to all public lodging establishments as defined in Chapter 509, *Florida Statutes*.

425.3.2 Public bathrooms.

425.3.2.1 Each public lodging establishment shall be provided with adequate and conveniently located bathroom facilities for its employees and guests in accordance with provisions of this section and the *Florida Building Code, Plumbing*. Public access to toilet facilities shall not be permitted through food preparation, storage, or ware washing areas. Bathroom fixtures shall be of readily cleanable sanitary design.

425.3.2.2 Public bathrooms shall be completely enclosed and shall have tight-fitting, self-closing doors or have entrances and exits constructed in such a manner as to ensure privacy of occupants. Such doors shall not be left open except during cleaning or maintenance.

425.3.2.3 Resort condominiums, nontransient establishments and resort dwellings are exempt from the provisions of this section.

425.3.3 Vermin control. Effective control measures shall be taken to protect against the entrance into the establishment, and the breeding or presence on the premises of rodents, flies, roaches and other vermin. All buildings shall be effectively rodentproofed. All windows used for ventilation must be screened, except when effective means of vermin control are used. Screening material shall not be less than 16 mesh to the inch or equivalent, tightfitting and free of breaks.

425.3.4 Fire safety. All fire safety, protection and prevention equipment must be installed, approved, maintained and used in accordance with Chapter 509, *Florida Statutes*, Chapter 69A-3 Fire Prevention—General Prevention Code, *Florida Administrative Codes*.

425.3.4.1 Specialized smoke detectors. Specialized smoke detectors for the deaf and hearing-impaired shall be made available upon request by guests in transient public lodging establishments without charge. Failure of the operator to inform any employee charged with registering guests of the location of such detector constitutes failure to make such detectors available.

425.3.5 Electrical wiring. To prevent fire or injury, defective electrical wiring shall be replaced and wiring shall be kept in good repair. Only a wall switch or approved pull cord shall be permitted in bathrooms. Electrical wiring shall be in accordance with the provisions of Chapter 27 of the *Florida Building Code, Building*.

425.3.6 Heating and ventilation. The heating and ventilation system shall be kept in good repair or be installed to maintain a minimum of 68°F (20°C) throughout the building.

425.3.7 Gas appliances. All appliances, including water heaters using gas, shall be properly vented as required by the *Florida Building Code, Fuel Gas*.

425.4 Sanitation and safety requirements.

425.4.1 Guest bathrooms.

425.4.1.1 Connecting bathrooms shall provide toilets with open-front seats. Guest and private bathrooms shall provide toilets. Guest, private, and connecting bathrooms shall provide lavatories and shower enclosures with hot and cold running water under pressure.

425.4.1.2 Each transient public lodging establishment shall maintain one public bathroom with a minimum of a toilet, lavatory, and shower enclosure for each sex on every floor for every 15 guests rooming on that floor not having access to private or connecting bathrooms.

425.4.2 Ice storage bins. Ice storage bins shall be drained through an air gap in accordance with the provisions of the *Florida Building Code, Plumbing*.

425.4.3 Locks. A locking device shall be provided in accordance with the *Florida Fire Prevention Code*. Public lodging establishments as defined in rule 61C-1.002(4)(a), *Florida Statutes*, shall have at least one approved locking device which does not include a sliding chain or hook-and-eye type device, on all outside and connecting doors which cannot be opened by a nonmaster guest room key.

SECTION 426 PUBLIC FOOD SERVICE ESTABLISHMENTS

426.1 Scope. Public food service establishments or food establishments shall comply with design and construction standards as described in the Food Code, Chapter 509 Part I or Chapter 500, *Florida Statutes*, as applicable.

Note: Other administrative and programmatic provisions may apply. See Department of Business and Professional Regulation (DBPR) Rule 61C-4, *Florida Administrative Code* Chapter 500 and Chapter 509, *Florida Statutes*.

426.2 Definitions.

PUBLIC FOOD SERVICE ESTABLISHMENTS. See Section 509.013, *Florida Statutes*.

FOOD ESTABLISHMENTS. See Section 500.03, *Florida Statutes*.

426.3 General sanitation and safety requirements. The following general requirements and standards shall be met by all food service establishments:

426.3.1 Water, plumbing, and waste. Except as specifically provided in this section, standards for water, plumbing and waste shall be governed by Chapter 5, Food Code, herein adopted by reference.

426.3.1.1 Grease interceptors shall be designed and installed in accordance with the *Florida Building Code, Plumbing*.

426.3.2 Public bathrooms.

426.3.2.1 Food service establishment shall be provided with adequate and conveniently located bathroom facilities for its employees and guests in accordance with provisions of the *Florida Building Code, Plumbing*. Public access to toilet facilities shall not be permitted through food preparation, storage, or ware washing areas. Bathroom fixtures shall be of readily cleanable sanitary design.

426.3.2.2 Public bathrooms shall be completely enclosed and shall have tight-fitting, self closing doors or, in public lodging establishments or bathrooms located outside a public food service, have entrances and

exits constructed in such a manner as to ensure privacy of occupants.

426.3.3 Vermin control. Effective control measures shall be taken to protect against the entrance into the establishment, and the breeding or presence on the premises of rodents, flies, roaches and other vermin. All buildings shall be effectively rodentproofed. All windows used for ventilation must be screened, except when effective means of vermin control are used. Screening material shall not be less than 16 mesh to the inch or equivalent, tightfitting and free of breaks.

426.3.4 Fire safety. All fire safety, protection and prevention equipment must be installed, approved, maintained and used in accordance with Chapter 509, *Florida Statutes*, Chapter 69A-55, *Uniform Fire Safety Standards for Public Food Service Establishments*, FAC, and the *Uniform Fire Safety Standards* as adopted by the State Fire Marshal.

426.3.5 Electrical wiring. To prevent fire or injury, defective electrical wiring shall be replaced and wiring shall be kept in good repair. Only a wall switch or approved pull cord shall be permitted in bathrooms. Electrical wiring shall be in accordance with the provisions of *Florida Building Code, Building*, Chapter 27.

426.3.6 Gas appliances.

426.3.6.1 All appliances, including water heaters using gas, shall be properly vented in accordance with the *Florida Building Code, Fuel Gas*. All appliances shall have a nationally recognized testing laboratory seal such as AGA or UL seal.

426.3.6.2 Heating appliances shall be properly sized in Btu input for room air space. Proper sizing of heating appliances shall be determined in accordance with the provisions of the *Florida Building Code, Fuel Gas*.

426.4 Sanitation and safety requirements.

426.4.1 Bathroom facilities. All bathrooms shall be of easy and convenient access to both patrons and employees and shall be located on the same floor of the premises served. For the purpose of this section, the same floor includes any intermediate levels between the floor and ceiling of any room or space not to exceed a vertical height of 8 feet (2438 mm). Public food service establishments whose occupancy is incidental to another occupancy may utilize public restrooms provided on the same floor. The travel distance may vary where adequate directional signs are provided and the number of fixtures is deemed satisfactory by the applicable plumbing authority. Each public food service establishment shall maintain a minimum of one public bathroom for each sex, properly designated, except as provided herein:

426.4.1.1 Places serving food or drink on a take-out, carry-out or delivery basis only which provide no seating shall be required to provide a minimum of one bathroom accessible to the public.

426.4.1.2 Arcades, malls, or flea markets containing public food service establishments which offer no seating within the public food service establishment may have centrally located bathroom facilities accessible to

patrons of the establishments in the arcade, mall, or flea market provided such bathroom facilities are within 300 feet (91 440 mm) of each establishment.

426.4.1.3 Public food service establishments located within theme parks and entertainment complexes may utilize centrally located bathroom facilities accessible to patrons of the establishments in the theme park or entertainment complex provided such bathroom facilities are reasonably accessible. For purposes of this section, reasonably accessible means within 300 feet (91 440 mm) of each establishment.

426.4.1.4 Public food service establishments which seat 10 persons or less shall be required to provide a minimum of one bathroom accessible to the public.

426.4.1.5 Public food service establishments located within a public lodging establishment shall be permitted to utilize public bathrooms located within the public lodging establishment, provided such bathrooms are available for use by the patrons of the public food service establishment during all hours of operation, are within 300 feet (91 440 mm) of the public food service establishment, and are located on the same floor as the public food service establishment. For purposes of this section, the same floor includes any intermediate levels between the floor and ceiling of any room or space without restriction as to vertical height.

SECTION 427 MENTAL HEALTH PROGRAMS

427.1 Public mental health crisis stabilization units and short-term residential treatment programs.

427.1.1 Scope. Crisis stabilization units and short-term residential treatment units shall comply with the design and construction standards in this section.

Note: Other administrative and programmatic provisions may apply. See Department of Children and Family Services (DCFS) Rule 65E-12, *Florida Administrative Code*, and Chapter 394, *Florida Statutes*.

427.1.2 Definitions.

CRISIS STABILIZATION UNIT (CSU). A state-supported mental health service or program and is a short-term alternative to inpatient psychiatric hospitalization and an integrated part of a designated public receiving facility under the authority of Chapter 394, *Florida Statutes*. A CSU provides brief intensive services for individuals who are presented as acutely mentally ill on a 24-hour-a-day, seven-day-a-week basis, under the licensing authority of the department of Children and Families and the Agency for Health Care Administration. The purpose of a CSU is emergency psychiatric reception, psychiatric examination, to stabilize and redirect people to the most appropriate and least restrictive treatment settings consistent with their needs.

SHORT-TERM RESIDENTIAL TREATMENT PROGRAM (SRT). A state-supported acute care 24-hour-a-day, seven-day-a-week residential alternative service, generally of 90 days or less, and which is an integrated part of a designated public receiving facility and receives state mental

health funds under the authority of chapter 394, F.S. The purpose of an SRT is to provide less acute intensive short-term treatment to individuals who have previously been admitted to either a hospital or CSU and have been transferred to the SRT as being temporarily in need of a 24-hour-a-day structured therapeutic setting in a less restrictive, but longer-stay alternative to hospitalization.

427.1.3 Facility standards for facilities licensed prior to or on July 14, 1993.

427.1.3.1 Building construction requirements.

427.1.3.1.1 Construction, additions, refurbishing, renovations, and alterations to existing facilities shall comply with the following codes and standards:

1. The building codes described in the *Florida Building Code*;
2. The fire codes contained in Chapter 69A-44, "Minimum Fire Safety Standards for Residential Alcohol and Drug Abuse Treatment and Prevention Programs, Mental Health Residential Treatment Facilities and Crisis Stabilization Units," *Florida Administrative Code*, as described in the NFPA 101, Chapters 18 and 19, Special Definitions, as adopted by the *Florida Fire Prevention Code*, as applicable to limited health care facilities, which is included by reference in Chapter 59A-3, *Florida Administrative Code*.

427.1.3.2 Minimum physical plant requirements.

Each CSU and SRT shall conform to the requirements of Sections 427.1.3.2.1 through 427.1.3.2.12.

427.1.3.2.1 In multiple occupancy bedrooms or sleeping areas there shall be a minimum of 60 square feet (6 m²) per bed and no less than a 30-inch (762 mm) separation between beds. Bedrooms shall be limited to a maximum of four occupants.

427.1.3.2.2 The minimum size of a single occupant bedroom shall be 55 square feet (5 m²).

427.1.3.2.3 Each CSU shall have at least one seclusion room and another room which may be used as a seclusion room. Each SRT shall have a seclusion room. Seclusion rooms shall be a minimum of 55 square feet (5 m²). If a restraint bed is utilized it shall have access around it and be bolted to the floor. Seclusion rooms shall minimally include a mattress. Ceilings shall be solid, and all lighting fixtures shall be tamperproof, and power receptacles are not permitted in the room.

427.1.3.2.4 The facility shall have at least one water fountain readily accessible for the use of persons receiving services.

427.1.3.2.5 The facility shall have a minimum ratio of one shower for each eight individuals and one toilet and lavatory for each six individuals. Individual shower stalls and dressing areas shall be provided. The use of gang showers is prohibited. Access to a bathroom shall not be through another person's room.

427.1.3.2.6 The facility shall have a locked area for personal possessions being held for safekeeping. Individual shelves or other similar dividers shall be provided in the locked area for the storage of personal possessions. The facility shall have written policies and procedures to ensure reasonable access to personal possessions.

427.1.3.2.7 Each facility shall have a fenced outside recreation area with a minimum fence height of no less than 6 feet (1829 mm) suitable for impeding elopements.

427.1.3.2.8 External windows shall have security screens or equivalent protection.

427.1.3.2.9 The facility shall provide an appropriate separate nontreatment area to serve as a general reception area with accommodations for such activities as receiving visitors. This reception area shall be separated from the treatment area by a locked doorway.

427.1.3.2.10 When a CSU is collocated with another program, as provided for in Section 65E-12.106(23), *Florida Administrative Code*, the following minimum facility requirements shall be met.

Collocation means the operation of CSU and SRT, or CSU and substance abuse detoxification services from a common nurses' station without treatment system integration. It may result in the administration of those services by the same organization and the sharing of common services, such as housekeeping, maintenance and professional services.

1. A CSU shall be separated and secured by locked doors, used by persons receiving services, from the SRT and detoxification units.
2. Whenever a CSU is collocated with an SRT or substance abuse detoxification unit there shall be no compromise in CSU standards. In all instances, whenever there is a conflict between CSU rules and SRT, alcohol or drug abuse rules, the more restrictive rules shall apply.

427.1.3.2.11 All CSUs shall be locked facilities and, to the maximum extent practical, provide a locked perimeter around a living unit and fenced exercise area within which individuals can reside 24 hours-a-day in an environment designed to minimize potential for injury. Where this is not possible, operational compensation shall be made as follows:

1. Each person receiving services shall be provided a minimum of 175 square feet (16 m²) of usable client space within the CSU. Useable client space is the sum, in gross square feet, of all rooms, interior wall to interior wall, that are part of a CSU and SRT facility. mechanical and electrical rooms, administrative and staff offices, screening areas, nurses' stations, visitor and reception areas, crawl space and attic space are excluded. Bedrooms shall be spacious and attractive, and activity rooms or space shall be provided.
2. CSU facilities shall be locked to provide reasonable control over access to and egress from

the unit, recreational area, and emergency reception areas. When individuals are moved to other areas, the pathways shall also be locked or have adequate control provisions to prevent elopement. Such controlled passageways shall include access to the emergency reception area, unit proper, off unit doorways, and recreational areas.

3. All unit door locks shall employ a common key for rapid access in emergency situations with quick releasing or single-turn mechanisms.

427.1.3.2.12 Food preparation areas for 13 or more persons shall comply with the provisions of Chapter 64E-11, *Florida Administrative Code*, “Food Hygiene.”

427.1.3.3 Health and sanitation.

427.1.3.3.1 Appropriate health and sanitation inspections shall be obtained before occupying any new physical facility or addition. A report of the most recent inspections must be on file and accessible to authorized individuals.

427.1.3.3.2 Hot and cold running water under pressure shall be readily available in all washing, bathing and food preparation areas. Hot water in areas used by persons being served shall be at least 100°F (38°C) but not exceed 120°F (49°C).

427.1.3.4 Seclusion room. Each CSU shall have at least one seclusion room located in the CSU facility. Additional space shall be available that can be used either as a seclusion room or bedroom, as need dictates. Policies and procedures shall be developed on handling emergency situations that require seclusion. Each SRT shall have a seclusion room.

427.1.4 Minimum construction standards for CSU and SRT facilities initially licensed after July 14, 1993.

427.1.4.1 Construction requirements.

427.1.4.1.1 New facility construction. New facility construction and additions, refurbishing, renovations and alterations to existing facilities shall comply with the following codes and standards:

1. The building codes described in the *Florida Building Code*.
2. The fire codes contained in Chapter 69A-44, “Minimum Fire Safety Standards for Residential Alcohol and Drug Abuse Treatment and Prevention Programs, Mental Health Residential Treatment Facilities and Crisis Stabilization Units,” *Florida Administrative Code*, as described in the NFPA 101, Chapters 12 and 13, “Special Definitions,” as adopted by the *Florida Fire Prevention Code*, as applicable to limited health care facilities, which is included by reference in Chapter 59A-3, *Florida Administrative Code*.
3. The accessibility requirements of Chapter 11 of the *Florida Building Code, Building*.

427.1.4.1.2 Plumbing. All plumbing shall comply with the requirements of the *Florida Building Code, Plumbing*.

427.1.4.1.3 Inspections and certificate of occupancy. Appropriate health and sanitation inspections and a certificate of occupancy shall be obtained before occupying any new facility or addition. A report of the most recent inspections must be on file and accessible to authorized individuals.

427.1.4.1.4 Sprinklers. No unsprinklered building classification as defined in the *Florida Building Code, Building*, is allowed. All facilities shall be protected throughout by an approved automatic sprinkler and smoke detection system to include a smoke detector in every bedroom. Provision shall be made for automatic emergency forces notification.

427.1.4.1.5 Surge protection. Surge protection in compliance with the *National Electric Code*, Article 280, as incorporated by reference in Chapter 27 of the *Florida Building Code, Building*, shall be installed to protect each service entrance equipment and have integral visual indication of surge protector failure. Additional surge protection shall be provided for all low-voltage and power connections to all electronic equipment and conductors entering or exiting the building and other life safety systems equipment such as fire alarm, telephone, and nurse call. Protection shall be in accordance with appropriate IEEE standards for the type of equipment being protected.

427.1.4.2 Overall functional design.

427.1.4.2.1 The CSU or SRT shall be designed to provide a locked perimeter around a living unit and fenced exercise area within which individuals can reside 24 hours a day in an environment designed to minimize potential for injury. The CSU or SRT structure shall be single story ground level facility. These facilities shall have separate off-unit reception and administration areas which may also be locked. Service corridors and pathways to other nonunit activities shall not be through the locked CSU or SRT unit.

427.1.4.2.2 The walls throughout all client areas of the CSU or SRT shall either be concrete block or a double layer of gypsum wallboard or ¾-inch (19 mm) thick plaster on metal lath to minimize maintenance of the facility. The general architecture of the unit shall provide for optimal line-of-sight observation from the nurses’ station throughout the unit, minimizing hidden spots and blind corners.

427.1.4.2.3 The CSU or SRT shall be designed to create a pleasant functional therapeutic environment throughout, by the use of sunlight, colors, designs, textures, and furnishings. The design shall achieve a secure unit which looks more residential than institutional in its construction and furnishings, while incorporating substantial safety considerations throughout.

427.1.4.2.4 The CSU or SRT shall be designed in order that the general unit be divided into a close observation

area and a general observation area based upon the need for frequent physical proximity, singular observation of individuals, and lowered stimulation levels. These areas do not need physical separation; for example, they may be the left and right sides of the unit.

427.1.4.2.4.1 Close observation area. This area shall include persons brought onto the CSU or SRT needing initial observation or restraints, individualized observation, and lowered stimulation levels, all of which require the frequent physical proximity of nurses. This area shall be directly adjacent to the primary unit doorway and nurses' station. The immediately adjacent rooms shall be used for single occupancy and restraint or seclusion. These rooms shall be remote from routine high activity areas and corridors.

427.1.4.2.4.2 General observation area. This shall include areas where persons routinely congregate or walk through such as multioccupant bedrooms, activity rooms, smoking areas, dining room and routine traffic corridors, or pathways. The dining and activity areas shall be directly observable, or under constant staff supervision, but may be a greater distance from the nurses' station.

427.1.4.2.5 All areas of CSUs and SRTs shall be ventilated by central, ducted supply and return forced air systems. Toilets, bathrooms and soiled function rooms shall be mechanically exhausted to the outside. Ventilation units shall distribute tempered heated or cooled air to all spaces and shall supply outside air in the quantity of either the sum of all exhausts or 20 cfm (.009 m³/s) per person whichever is greater. The quality of all exhausts must match the intake volume of all outside air. Supply, exhaust, and return fans shall run continuously while the building is occupied. Areas in which smoking is permitted shall be well vented by at least 35 cfm (.02 m³/s) per person to the outside in order to minimize smoke diffusion throughout the unit.

427.1.4.2.6 All doors opening directly onto the unit from nonclient rooms or office areas shall be equipped with locksets which are key released to leave the client area and permit unobstructed return to the client area. Door closures are required to deny persons receiving services accidental unsupervised access to the contents of staff offices, janitorial closets, and mechanical areas.

427.1.4.2.7 Corridors shall ensure maximum clear distances by recessing water fountains and fire extinguishers, or placing them in alcoves. Corridors in client areas must be at least a 6 foot (1829 mm) clear width; nonclient areas must be at least 44 inches (1118 mm) minimum clear width. Corridor ceilings shall be a minimum height of 7 feet 6 inches (2284 mm).

427.1.4.2.8 Hot and cold running water under pressure shall be readily available in all washing, bathing, food preparation, and food handling areas. Hot water

in client areas shall be at least 100°F (38°C), but not exceed 120°F (49°C).

427.1.4.2.9 The minimum size for doors shall be no less than 3 feet (914 mm) wide and 6 feet 8 inches high (2032 mm). Areas accessible to persons with physical disabilities shall comply with applicable codes and standards.

427.1.4.2.10 Since glass fragments are a safety hazard throughout the unit, the use of glass shall be minimal.

427.1.4.2.11 All television sets must be securely fastened.

427.1.4.2.12 Door closures shall not be utilized in unobserved client areas.

427.1.4.2.13 All CSUs and SRTs equipped with electronic locks on internal doors or egress doors shall ensure that such locks have manual common key mechanical override that will operate in the event of a power failure or fire. Egress pathways and doors shall be locked as provided for in the *Life Safety Code*, NFPA 101, Chapter 12, as incorporated by reference in Chapter 59A-3, *Florida Administrative Code* as adopted by the *Florida Fire Prevention Code*,

427.1.4.2.14 CSUs and SRTs with electronic or magnetic door locks or other fundamental operational components which are electric shall have either: a battery back-up system rated for facility emergency power draw and capable of sustaining door locks and emergency operations for a minimum period of 6 hours; or an emergency generator with transfer switch with a battery pack back-up system capable of operating for 2 hours at facility emergency power draw level.

427.1.4.2.15 The use of door vision panels and windows shall minimize the opportunity for isolation of staff or persons served in unobserved areas. This does not include privacy provisions such as bathrooms and bedrooms.

427.1.4.3 Uniform specifications.

427.1.4.3.1 The design shall ensure that each person receiving services in a CSU or SRT is provided a minimum of 175 square feet (16 m²) of usable client space.

427.1.4.3.2 Tamper-resistant screws shall be used to protect electrical switches and outlets throughout the facility in all areas accessible to persons receiving services. Lighting fixtures shall be tamperproof type throughout the facility in all areas accessible to persons receiving services.

427.1.4.3.3 All electrical switches and outlets in wet areas shall be ground-fault protected with a remote breaker switch. Tamperproof, safety type duplex outlets shall be used in all areas accessible to persons receiving services.

427.1.4.3.4 Air ducts shall be covered with a perforated type metal grille not residential louvered grilles, throughout the unit in all areas accessible to persons receiving services.

427.1.4.3.5 All hose bibbs shall be equipped with a vacuum breaker device.

427.1.4.3.6 The unit shall have a minimum of one drinking fountain.

427.1.4.3.7 Ceiling height in bedrooms, activity areas, and bathrooms shall be at least 9 feet (2743 mm).

427.1.4.3.8 The operation of all perimeter locks shall ensure reasonable control over both access and egress.

427.1.4.4 Administration and public areas.

427.1.4.4.1 Waiting rooms shall have an adjacent rest room which is designed to accommodate persons with physical disabilities in accordance with Chapter 11 of the *Florida Building Code, Building*.

427.1.4.4.2 The entrance shall be grade level, sheltered from inclement weather and accessible to persons with physical disabilities in accordance with Chapter 11 of the *Florida Building Code, Building*.

427.1.4.4.3 The lobby shall include a drinking fountain and space for clerical personnel. Private interview space for emergency screening of voluntary persons shall be adjacent to the lobby.

427.1.4.5 Emergency screening area for CSUs.

427.1.4.5.1 This shall be a locked area in which law enforcement admissions may be received. This area shall not be wholly isolated visually from the CSU to provide safety for emergency screening personnel who may become isolated in this area. This area shall provide for medical clearance, emergency screening, bathroom facilities, and other activities which may be necessary.

427.1.4.5.2 A separate entrance shall be provided directly to emergency screening areas and examination rooms for law enforcement personnel. It shall have a driveway where a law enforcement vehicle can pull immediately adjacent to the building before transferring a person through the separate entrance to the emergency screening area. The law enforcement entrance shall also have a lock box where the law enforcement officer can lock his weapons during such time as he or she is in the facility.

427.1.4.5.3 A separate bathroom with supervised shower area shall be located so that all persons being admitted may be showered before being admitted to the residential section of the unit.

427.1.4.6 Seclusion rooms.

427.1.4.6.1 Each CSU shall have a minimum of two seclusion rooms that shall share a common vestibule with a bathroom off the vestibule area. Each SRT shall have at least one seclusion room. Seclusion rooms shall be free of sharp edges or corners and be strongly constructed to withstand repeated physical assaults. Walls shall be either concrete block or double layered to provide resistance and be smooth. The ceilings shall be 9 feet (2743 mm) in clear height, hard-coated, and light-

ing fixtures recessed and tamperproof. Lighting fixtures shall be nonbreakable, preferably Lexan, and shall be installed with tamperproof screws, as shall any other items in the seclusion rooms. The seclusion room door shall be heavy wood or metal at least 36 inches (914 mm) in width and shall open outward. The door frame shall be heavy steel and shall be thoroughly bolted into the wall and cemented in.

427.1.4.6.2 At least one seclusion room in the CSU shall have a sturdily constructed bed, without sharp edges and bolted to the floor. A bed in the SRT seclusion room is optional; however, if present, the bed shall meet the same requirements as specified for the CSU. Its placement in the room shall provide adequate space for staff to apply restraints and not assist individuals in tampering with the lights, smoke detectors, cameras, or other items that may be in the ceiling of the room. There shall be a rheostat control mechanism outside the room to adjust the illumination of the light in the seclusion room.

427.1.4.6.3 The floor and walls, up to a height of 3 feet (914 mm), shall be coated with an impermeable finish to resist penetration of body fluids. One seclusion room shall have a floor drain. A hose bibb shall be in a readily adjacent area such as a bathroom.

427.1.4.6.4 There shall be a vision panel in the door of the seclusion room, no larger than 8 inches by 8 inches (203 mm by 203 mm), which provides a view of the entire room. This vision panel shall be Lexan or other suitably strong material and it shall be securely mounted in the door. Provisions shall be made to ensure privacy from the public and other persons receiving services while providing easy access for staff observation.

427.1.4.6.5 Seclusion rooms shall be a minimum of 70 square feet (7 m²) and a minimum room dimension of 9 feet (2743 mm).

427.1.4.6.6 Fire sprinkler heads shall be ceiling mounted and either recessed or flush-mounted type without a looped spray dispersal head.

427.1.4.6.7 A voice-activated and switchable emergency calling system for monitoring persons receiving services shall be provided in each seclusion room.

427.1.4.6.8 Each seclusion room shall have an electronic visual monitoring system capable of viewing the entire room and be monitored from the nurses' station.

427.1.4.7 Janitor's closet.

427.1.4.7.1 A janitor's closet shall be on the unit. It shall contain a floor receptor for mop water and provide space for mop bucket, brooms, and other minimal items. Caustic and other dangerous chemicals shall not be stored in this closet.

427.1.4.7.2 This closet shall have an automatic door closer and have automatic relocking type lock.

427.1.4.8 Bathrooms.

427.1.4.8.1 Access to a bathroom shall not be through another person's bedroom. Bathrooms shall provide space, in addition to bathing, for dry clothes and changing of clothes and for observation staff. The shower head shall be recessed or have a smooth curve from which items cannot be hung. There shall be no overhead rod, privacy stall supports, protrusions, or fixtures capable of carrying more than 40 pounds (18 kg) of weight. The ceiling shall be hard coated. Sprinkler heads shall be either recessed or a flush-mounted type dispersal head. The toilet shall be a flushometer-type, not residential with water tank and cover. Toilets shall be of heavy duty construction securely fastened to the floor and have seats with locking nuts. Secure cleanout access shall be provided for the toilet to clean out plugs and pipes. Floor drains in bathroom areas shall be of sufficient size that they cannot be plugged by standing on them.

427.1.4.8.2 Mirrors shall not be common glass. A polycarbonate mirror, fully secured, and flat-mounted to the wall is required. Polished metal mirrors shall not be permitted.

427.1.4.8.3 Lighting fixtures shall be recessed and tamperproof with Lexan or other strong translucent material.

427.1.4.8.4 Bathroom fixtures, shower, lavatory, and toilet shall be readily accessible from a common area. If not accessible from a common area, they will be deemed to be available only to the occupants of directly adjoining bedroom or bedrooms.

427.1.4.8.5 Each CSU and SRT shall have a bathroom of sufficient size for use by persons with physical disabilities. It shall include toilet, lavatory, shower, and safety grab bars for shower and toilet.

427.1.4.8.6 The facility shall have a minimum ratio of one shower for each eight persons receiving services and one toilet and lavatory for each six persons receiving services. Individual shower stalls and dressing areas shall be provided. The use of gang showers is prohibited.

427.1.4.9 Nurses' station.

427.1.4.9.1 The nurses' station shall be positioned so that the unit may be under constant direct visual surveillance. Charting and records areas shall be located in the rear of the nurses' station, and not in a separate area, so that staff on duty can readily observe the client areas. A bathroom shall be nearby for staff use. The nurses' station, if separated from client areas, shall utilize either Lexan or safety wire glass for enclosure to above counter top level. If not enclosed the counter top shall be at least 18 inches (457 mm) in width.

427.1.4.9.2 Thirty is the maximum number of beds which may be served by a common nurses' station in colocated units, as described in Section 65E-12.106(23), F.A.C.

427.1.4.9.3 The nurses' station, which functions as the primary control center, shall have necessary elec-

tronic assistance such as camera monitors and intercoms in more remote areas where persons may become isolated. Areas warranting visual and auditory monitoring include remote entrance or egress doors, isolated hallways, after hours law enforcement entrance, emergency screening area, and fenced recreational yard.

427.1.4.10 Medication room. The medication room shall be located near the nurses' station. The medication room shall have a sink, refrigerator, locked storage, and facilities for dispensing medication. Security against unauthorized access shall be assured. The refrigerator shall store medications and clean materials only.

427.1.4.11 Examination room. A suitable examination room shall be provided for physical examinations, nursing assessments, and other related medical activities. It shall include a sink for hand washing.

427.1.4.12 Bedrooms.

427.1.4.12.1 Ceilings shall be nonaccessible to prohibit persons receiving services from entering attic spaces or having access to overhead pipes and beams. Light switches and electrical outlets shall be secured with nontamper type screws. When feasible each bedroom shall have a window, operable by staff, with an exterior view. Window sills shall not exceed a height of 36 inches (914 mm) above floor level and should incorporate protective screens or Lexan-type material to prevent direct access to glass surfaces. There should be no overhead protrusions available for hanging in excess of 40 pounds (18 kg) weight.

427.1.4.12.2 Beds and other heavy furniture suitable for barricading the door shall be secured to the floor or walls.

427.1.4.12.3 multiple occupant bedrooms shall be limited to a maximum of four occupants and shall be a minimum size of 60 square feet (6 m²) per bed with no less than a 30-inch (762 mm) separation between beds. Single occupant bedrooms shall be a minimum of 80 square feet (7 m²).

427.1.4.12.4 Bedroom doors shall be a minimum of 36 inches wide.

427.1.4.13 Kitchen and nourishment preparation area.

427.1.4.13.1 Preparation or food handling areas shall have water and plumbing fixtures suitable for cleaning dining utensils. The requirements for nourishment preparation areas are less than that of kitchens due to the minimal scale of operations for these areas. If these areas are accessible to persons receiving services, they should include appropriate safety considerations for sharp and other dangerous instruments and the elimination of hot surfaces. Space shall be provided for disposal of wet garbage. Refrigeration and freezer space shall be provided in these areas for the carryover of a minimum amount of perishable food.

427.1.4.13.2 Kitchens shall comply with Chapter 64E-11, *Florida Administrative Code*, Food Preparation and Sanitation Requirements, as well as the 1985 NFPA 101, Chapters 12 and 13, Fire Safety Requirements as incorporated by reference in Chapter 59A3, *Florida Administrative Code* as adopted by the *Florida Fire Prevention Code*. Kitchens shall be designed with flow-through type operation where food arriving is immediately placed into dry storage or freezer units without walking through food preparation areas. The flow-through type system would provide for the preparation of food, serving and dishes returned with garbage and waste going out to an adjacent dumpster and can wash with water collection curbing and drain. A concrete pad shall be provided for the trash dumpster and garbage truck entrance.

427.1.4.13.3 Kitchens shall be equipped with fire suppression hoods and through-wall grease laden air evacuation and ventilation systems. All electrical outlets shall be ground-fault circuit interrupter protected. If meals are to be served via an open area, directly from the kitchen, this area shall have a fire-rated steel retractable overhead door type mechanism to continue the fire wall protection around the kitchen area. Kitchens shall have heat detectors rather than smoke sensors.

427.1.4.13.4 External to the kitchen, and outside the waste exit door, there shall be a curbed slop sink for mops and dirty kitchen water with an immediately accessible hose bibb and drain. This area shall be external to the kitchen area, but immediately adjacent to it, to provide ready disposal of waste water as well as for the removal of cleaning items from the kitchen when they are not in use.

427.1.4.13.5 There shall be a large food storage pantry in or adjacent to the kitchen.

427.1.4.13.6 Facilities using off-site kitchens for food preparation shall have an onsite food reception, warming, and holding area of sufficient size and with sufficient equipment to warm and hold food for each meal served. Required space shall include provision for proper disposal or holding of used implements and disposal of wet garbage in accordance with Chapter 64E-11, *Florida Administrative Code*.

427.1.4.14 Dining area. Each CSU or SRT shall have an attractive dining area on the unit. Seating capacity shall reflect the licensed capacity of the entire CSU or SRT, although residents may eat or be served in shifts during daily operations. Individual, rather than bench seating, shall be used for easy floor cleaning.

427.1.4.15 Unit laundry facilities.

427.1.4.15.1 Provision shall be made for the storage of soiled laundry in an adjacent, isolated, fire-resistant area.

427.1.4.15.2 Each CSU or SRT shall have a personal laundry room which shall incorporate a flow-through design in which dirty laundry enters, is sorted, placed

in the washer, dried, folded, and moved out without crossing clean laundry with dirty laundry. CSUs and SRTs shall have a small washer and dryer for immediate unit needs and to wash clothes. These washing and drying units shall be equipped to sanitize clothes as a preventive measure of infection control.

427.1.4.15.3 The soiled laundry room shall have a locked door equipped with automatic door closer to restrict access to cleaning chemicals. The soiled laundry room air shall be exhausted outside the facility.

427.1.4.16 Clean laundry room.

427.1.4.16.1 A separate space shall be provided for clean laundry capable of storing an adequate supply of laundry for the size of the CSU or SRT. The laundry closet shall have a locked door to prevent access to these items by persons receiving services.

427.1.4.16.2 Items stored on the top shelf shall provide an 18 inch (457 mm) clear space from sprinkler heads so as to not block dispersal of water.

427.1.4.17 Fenced recreational area.

427.1.4.17.1 CSUs and SRTs shall have a no less than 6-foot-high (1829 mm) fenced, out-of-doors area where persons receiving services may have access to fresh air and exercise. It must provide privacy for persons receiving services otherwise exposed to public view. This area shall be constructed to retain persons inside the area and minimize elopements from the area, although it is not a secure area.

427.1.4.17.2 The fenced area shall provide some shaded area where persons receiving services may be out of doors without being in direct sunlight or may receive sunlight as they desire. The enclosing fences shall have an exit gate which is located away from the building as a secondary egress from the fenced area, for use in fire situations, or access by lawn maintenance equipment. The gate shall be provided with a lock which is readily accessible from both sides. The area of this fenced enclosure shall be at least 1,100 square feet (102 m²) including an activity area having dimensions of not less than 20 feet by 40 feet (6096 mm by 1219 mm).

427.1.4.17.3 Objects shall not be placed near the fence to provide a ready step ladder over the fence and, if fabric fencing is used, the horizontal bracing used for corners shall be outside the fabric to preclude its use as an escape ladder step. The fenced area shall be designed, without blind corners, to be readily visible by one staff member standing in a central location. If desired, the fence may be topped with a 45-degree inward slanting restraining-type wire. The use of barbed wire and other sharp injurious materials, however, is prohibited.

427.1.4.17.4 This area, as all other primary fire exit routes, shall have egress lighting which is connected to the power side of the facility electrical panel so that in the event of a fire and electrical panel disconnect, the exit and congregation areas would still have lighting.

427.1.4.18 Multipurpose room. In addition to open, onunit floor space, each CSU and SRT shall have an accessible multipurpose room for group activities of at least 180 square feet (7 m²). This area may be the dining area.

427.1.4.19 Off unit storage areas.

427.1.4.19.1 Each CSU and SRT shall have appropriate storage, in nonclient areas, for operating supplies and materials.

427.1.4.19.2 Adjacent nonclient area storage for personal belongings shall be a minimum of 8 cubic feet (.23 m³) for each person receiving services.

427.2 Community mental health regulation. Adult residential treatment facilities (RTFs) shall be limited to adults and comply with the regulations in sections 427.2.1 through 427.2.4.

Note: Other administrative and programmatic provisions may apply. See Department of Children and Family Services (DCFS) Rule 65E-4.016, *Florida Administrative Code*, and Chapter 394, *Florida Statutes*.

427.2.1 Facility standards.

427.2.1.1 Building construction requirements. The construction and renovation of a facility shall comply with the provisions of the *Florida Building Code*.

427.2.2 Health and safety. Facilities and additions shall be constructed to allow full compliance with the provisions of this section.

427.2.2.1 Fire safety.

427.2.2.1.1 Residential treatment facilities shall comply with all applicable federal, state and local fire safety standards as follows:

1. Level IA licensed facilities shall comply with the fire codes contained in Chapter 69A-3, *Fire Prevention-General Provisions, Florida Administrative Code*, as described in the NFPA. 101, Chapters 18 and 19, Special Definitions as adopted by the *Florida Fire Prevention Code*, as applicable to limited health care facilities.
2. For facility Level IB, which may have no more than three residents incapable of self-preservation, and for facility Levels II, III, IV and V, which may have no residents incapable of self-preservation, each resident record shall have a signed statement by a physician or licensed psychologist regarding the resident's capability of self-preservation.
3. Facility Levels IB, II, III, IV and V shall have a prompt evacuation capability.

427.2.2.1.2 Level IV and V facilities shall have a written policy on the safe use of extension cords and adapters. The use of extension cords and adapters is prohibited in Level I, II and III facilities.

427.2.2.1.3 Electrical cords and appliances shall be maintained in a safe condition.

427.2.2.1.4 Portable heating devices shall be used only in emergency situations as defined in agency procedures approved by the governing board.

427.2.2.1.5 Flammable liquids or gas cylinders shall not be positioned near flame or heat sources, nor stored with combustible materials.

427.2.2.1.6 Emergency power. The facility shall provide egress lighting that will operate in the event of a power failure.

427.2.2.1.7 Smoking. The program shall have a written policy governing smoking in the facilities. Smoking shall be prohibited in any area of the facility where combustible supplies, materials, liquids or gases will be used or stored.

427.2.2.1.8 Fire safety inspections. A fire safety inspection shall be obtained before occupying any new physical facility or addition.

427.2.2.2 Personal safety.

427.2.2.2.1 The building shall be free of hazards such as cracks in the floors, walls or ceiling; warped or loose boards, tile, linoleum, handrails or railings; and broken window panes or missing window screens.

427.2.2.2.2 Protection shall be provided from sharp or jagged projections, "invisible" glass, moving parts, heated surfaces, heavy objects that could fall, or any other potentially hazardous condition.

427.2.2.2.3 Grab bars shall be nonremovable.

427.2.2.2.4 The temperature of the hot water supply shall be regulated and shall be between 105°F (41°C) and 115°F (46°C) at the outlet.

427.2.2.2.5 Any electrical fans, except ceiling paddle fans, shall be screened. All electrical fans, including paddle fans, shall be placed in a safe location.

427.2.2.2.6 Indoor and outdoor recreational areas shall be provided with safeguards designed for the needs of the residents.

427.2.2.2.7 Outdoor recreational areas shall be well drained.

427.2.2.3 Health and sanitation.

427.2.2.3.1 Appropriate health and sanitation inspection certificates shall be obtained before occupying any new physical facility or addition, and at least yearly or as required by statute, thereafter. A report of the most recent inspection must be on file and accessible to authorized individuals.

427.2.2.3.2 Hot and cold running water under pressure shall be readily available in all washing, bathing and food preparation areas.

427.2.2.3.3 The kitchen and food preparation area shall be well-lighted, ventilated and located apart from areas which could cause food contamination. All doors and windows in the kitchen and food preparation areas that open to the outside shall be screened.

427.2.3 Food service.

427.2.3.1 For food service areas with a capacity of 13 or more residents, all matters pertaining to food service

shall comply with the provisions of Chapter 64E-11, *Florida Administrative Code*.

427.2.3.2 Food preparation, sanitation and storage.

427.2.3.2.1 Each refrigerator or freezer used for storage of perishable foods shall be provided with an accurate indicating thermometer located in the warmest part toward the front side of the refrigerator or freezer so that the temperature can be easily and readily observed.

427.2.3.2.2 Freezers should be kept at or below 0°F (-18°C).

427.2.3.3 Dining.

427.2.3.3.1 Dining tables shall seat small groups of residents unless other arrangements are justified on the basis of resident needs.

427.2.3.3.2 The dining area shall be suitably lighted, ventilated and furnished.

427.2.4 Environment.

427.2.4.1 Residential facilities shall not be identified by an exterior sign or vehicle sign that labels the residents or special functions of the facility. Vehicle traffic and parking relating to the facility shall be similar to that of surrounding structures or residences.

427.2.4.2 The grounds of the facility shall have adequate space for resident activities.

427.2.4.3 The facility shall be accessible to persons with disabilities or the facility shall have written policies and procedures that describe how disabled individuals can gain access to the facility for necessary services.

427.2.4.4 Areas that accommodate the following shall be available:

1. A full range of social activities;
2. Private conversations;
3. Group activities; and
4. Resident privacy, when appropriate.

427.2.4.5 All areas of the facility occupied by residents shall be climatically controlled in a manner conducive to the comfort and privacy of the residents and shall include the following:

427.2.4.5.1 A design temperature of at least 72°F (22°C) and not to exceed 85°F (29°C) shall be used for waking hours in all areas used by residents. During sleeping hours, a temperature of at least 68°F (20°C) shall be used. These temperature requirements apply unless otherwise mandated by federal or state authorities.

427.2.4.5.2 When cooling devices are used, they shall be placed or adjusted in a manner which minimizes drafts.

427.2.4.6 Drinking water shall be readily available and easily accessible to residents.

427.2.4.7 Mirrors reasonably free of distortion shall be placed in appropriate places to aid in grooming and to enhance self-awareness.

427.2.4.8 Clocks shall be provided to promote awareness of time and day.

427.2.4.9 The use of door locks or closed sections of the building shall comply with all applicable safety standards.

427.2.4.10 Clean, well-lighted and ventilated laundering facilities for resident use shall be available on the premises or in the immediate neighborhood.

427.2.4.11 A telephone which allows private conversations shall be available and easily accessible within the facility.

427.2.4.12 Facility lighting shall promote clear perceptions of people and functions. When and where appropriate, lighting shall be controlled by residents.

427.2.4.13 Whenever feasible, the environment shall provide views of the outdoors.

427.2.4.14 Bedrooms. Bedrooms shall be designed to meet the following criteria:

427.2.4.14.1 All resident bedrooms shall be ventilated, well-lighted and located convenient to a bathroom.

427.2.4.14.2 Resident bedrooms designated for single occupancy shall provide a minimum inside measurement of 80 square feet (7 m²) of usable floor space.

427.2.4.14.3 Resident bedrooms designated for multiple occupancy shall provide a minimum inside measurement of 60 square feet (6 m²) of usable floor space per bed and be limited to four occupants.

427.2.4.14.4 All resident bedrooms shall open directly into a corridor, a common use area or the outside, except in those facilities comprised of apartments.

427.2.4.14.5 Each resident bedroom where furnishings are supplied by the facility shall be furnished with personal storage space and adequate space for hanging clothes

427.2.4.14.6 Bedroom doors shall not have vision panels.

427.2.4.15 Bathrooms. Bathrooms shall be designed to meet the following criteria:

427.2.4.15.1 A toilet and lavatory facility shall be provided for every six residents, and toilets shall be equipped with seats.

427.2.4.15.2 A minimum of one tub or shower facility, equipped with nonslip devices, shall be provided for every eight residents.

427.2.4.15.3 Bathrooms shall be ventilated, adequately lighted and have clearly labeled hot and cold running water.

427.2.4.15.4 Each bathroom shall have a door in working order to assure privacy.

427.2.4.15.5 When there is more than one toilet or bathing facility in a bathroom, provisions are required for privacy.

427.2.4.15.6 Bathrooms used by residents with disabilities shall be equipped to ensure safety and independent mobility.

427.2.4.15.7 Sole access to toilet or bathing facilities shall not be through another resident's sleeping room, except in facilities comprised of apartments.

427.2.4.16 Common living areas. Common living areas shall be designed to meet the following criteria:

427.2.4.16.1 A room, separate from sleeping areas, shall be provided where residents may read or engage in socialization or other leisure time activities.

427.2.4.16.2 A minimum of 35 square feet (3 m²) of living and dining space per resident shall be provided by all facilities except those comprised of apartments. This space shall include living, recreational and other space designated accessible to residents, but shall not include bathrooms, corridors, storage space, or screened porches which cannot be adapted for year round use. Facilities with bedrooms which include living space may count the square footage that is in excess of the bedroom square footage requirements as part of the 35 square footage (3 m²) living and dining space requirements.

SECTION 428 MANUFACTURED BUILDINGS

428.1 General. The following administrative requirements for inspection and plan review apply to manufactured buildings including factory-built schools. Additional technical requirements for factory-built schools can be found in Section 423.

Note: See Department of Community Affairs (DCA) Rule 9B-1, *Florida Administrative Code* and Chapter 553, *Florida Statutes*.

428.2 Definitions.

428.2.1 "Third-party agency" means an individual or entity authorized to perform inspections of or review plans for manufactured buildings as provided by Rule 9B-1, *Florida Administrative Code*.

428.2.2 "Factory-built school" means any building designed or intended for use as a school building which is manufactured in whole or in part at an off-site facility, including prefabricated educational facilities, factory-built educational facilities and modular built educational facilities that are designed to be portable, relocatable, demountable or reconstructible, are used primarily as classrooms or the components of an entire school and do not fall under the provisions of Sections 320.822-320.862, *Florida Statutes*.

428.2.3 Department. Refers to Department of Community Affairs.

428.3 Inspections. Inspection of installation of manufactured buildings and construction activities conducted at the site of the installation shall be conducted pursuant to Chapter 1 hereof. Inspections during the manufacturing process shall be conducted by those third-party agencies as follows:

428.3.1 Inspections shall be conducted at the manufacturing facility by an appropriately licensed representative of a third-party agency selected by the manufacturer. The inspections shall be to ensure that the buildings are being manufactured in compliance with the applicable codes and the approved plans. Once a third-party agency has inspected a manufactured building, the manufacturer shall not seek to have the building inspected by another agency, nor shall any agency inspect a building that has already been inspected by another unless the subsequent inspection is at the direction of the department or unless the building or modification thereto is being inspected for recertification by the department.

428.3.2 At a minimum, a certified third-party agency shall meet the criteria in Sections 428.3.2.1 through 428.3.2.4.

428.3.2.1 With regard to manufactured buildings, observe the manufacture of the first building built subsequent to the plan approval or the selection of the agency, whichever occurs last, from start to finish, inspecting all subsystems thereof. Continual observation and inspection shall continue until the third-party agency determines that the implementation of the manufacturer's quality control program in conjunction with application of the approved plans and specifications and the manufacturer's capabilities result in a building that meets or exceeds the standards adopted herein. Thereafter, the agency shall inspect each module produced during at least one point of the manufacturing process and shall inspect the entire production line during each plant inspection, so that a minimum of 75 percent of the modules inspected will have a minimum of one of the subsystems (electrical, plumbing, structural, mechanical or thermal) exposed for inspection.

428.3.2.2 With regard to components, observe the manufacture of the first unit assembled subsequent to the plan approval or the selection of the agency, whichever occurs last, from start to finish, inspecting all subsystems thereof. Continual observation and inspection shall continue until the third-party agency determines that the implementation of the manufacturer's quality control program in conjunction with application of the approved plans and specifications and the manufacturer's capabilities result in a component that meets or exceeds the codes and standards adopted herein. Thereafter, the third-party agency shall inspect not less than 50 percent of the manufactured building components or 20 percent of storage sheds that are not designed for human habitation and that have a floor area of 720 square feet (67 m²) or less manufactured pursuant to the approved plan,

428.3.2.3 During each inspection, the agency shall verify that the manufacturer's inplant quality control program is working as set forth in the approved quality control manual.

428.3.2.4 Should work stop on a particular module or component for a period of two months, reinspection shall be required.

428.3.3 When a third-party agency discovers a deviation from the code or the approved plans which creates or threatens an imminent life safety hazard, all buildings or components which have progressed through that stage of production since the agency's previous inspection shall be inspected to ensure the absence of that deviation, and the agency shall immediately notify the manufacturer and the department in writing. Any building or component exhibiting the deviation shall be brought into conformance with the applicable code or the approved plans by the manufacturer within thirty days of notification of the deviation by the third party agency. The corrective action must be left available for reinspection by the third-party agency.

428.3.4 The third-party agency shall note all inspections, deviations and corrective actions in a written inspection report and shall complete the inspection report portion of the building code information system available via the Internet.

428.3.5 The agency shall give a copy of the inspection report(s) to the manufacturer for record and shall retain another copy. The agency or the manufacturer shall provide a copy of an inspection report to the department when requested.

428.4 Design plan and systems approval. Plan review pertaining to installation of manufactured buildings and construction activities conducted at the site of the installation shall be conducted pursuant to Chapter 1 hereof. Plan review pertaining to construction activities occurring within the manufacturing process shall be conducted by those third-party agencies as follows: third-party agencies shall review plans in conformity with Chapter 1 hereof and the following additional requirements: If the plans are for a residential manufactured building, certification from the design professional responsible for the plans that the structure has been designed only for erection or installation on a site built foundation in accordance with this code. If the residential manufactured building is transportable in one or more sections and is 8 body feet or more in width or 40 body feet (12 192 mm) or more in length, or, when erected on site, is 320 square feet (29 m²) or more, and which is built on a permanent chassis, the manufacturer shall certify that the manufactured building has been excluded from regulation by the United States Department of Housing and Urban Development.

428.4.1 Plan approval expiration. Upon revision of the *Florida Building Code* plan approvals shall expire upon the latter of the effective date of that revision or 90 days from adoption of that revision by the Florida Building Commission unless the manufacturer files with the department a sworn statement by a third-party agency that the plans have been reviewed and that they are in compliance with the revisions to the *Florida Building Code*.

428.4.2 Evidence of third-party agency approval. Approved plans and specifications shall be evidenced by a letter certificate from the agency. Approved copies of the design plans and specifications shall be returned to the manufacturer with an agency approval letter indicating the limi-

tations, if any, of such approval. An approved copy of the plans shall be available at each place of manufacture, which shall be made available for inspection and monitoring. Upon approval of the plans, the third-party agency shall submit a copy of the plans bearing the approval stamp to the department together with a list of any limitations of that plan approval and a separate copy of the plans and limitations on compact disk in a readable format.

428.5 Alterations.

428.5.1 On-site modifications. On-site modification to manufactured buildings must be inspected by either a third party agency or by the authority having jurisdiction and must comply with the *Florida Building Code*. The authority having jurisdiction has superseding authority over any onsite modifications to a manufactured building or may delegate this authority to the department in writing on a case-by-case basis. Upon issuance of a certificate of occupancy for the modified manufactured building, the old insignia shall be removed and returned to the department.

428.5.2 In order to recertify a used manufactured building that is being relocated and not otherwise altered, the owner must provide the approved inspection agency with a set of the original approved plans for the building and any modification of the building. As-built plans shall be acceptable as an alternative to approved plans for factory-built schools manufactured prior to July 1, 2001. Once the agency has evaluated the continued compliance of the building with those plans and certifies to the department that the building is in compliance with the applicable codes, the approved inspection agency shall affix a recertification insignia to the building. If a building complied with the code in effect on the date of the original plan approval, the applicable code as set forth above shall be that which was in effect on the date of the original plan approval. The relocation of a manufactured building does not constitute an alteration.

428.6 Factory-built schools, plan review (also see Section 423, State requirements for education facilities). Plan review of plans for newly constructed factory-built schools shall be performed by the third-party agency selected by the department. An applicant for plan approval shall submit complete plans to an agency in the manner and format agreed to by the agency and the applicant. Plan submittals shall include a schedule of inspections which shall be performed periodically as necessary to ensure that the building complies with applicable standards. Upon determination by the agency that the plans submitted comply with all applicable standards, the agency shall certify such determination by affixing an approval stamp on each page of the plans, and shall return one copy to the applicant, maintain an original set, and submit one copy electronically to the department. The agency shall be compensated for the actual cost of the plan review by the applicant. No manufacturing activity shall commence until plan approval has been obtained from the third-party agency. Plan review at a minimum shall include those items identified in Chapter 1 hereof. Plans for modification of factory-built schools shall be reviewed by an approved third-party agency selected by the manufacturer as set forth in 9B-1.009, *Florida Administrative Code*.

428.7 Factory-built schools, inspections and work progress reports (also see Section 423, state requirements for education facilities).

428.7.1 Inspectors. The school board or community college (educational entity) which is to utilize the factory-built school shall be responsible for compliance with inspection requirements.

428.7.2 Existing buildings. Factory-built schools designated as existing buildings shall be inspected to determine compliance with the standards adopted in Section 423 hereof. All deficiencies shall be noted in an inspection report provided to the educational entity upon completion of the inspection. Activities performed to rehabilitate a noncompliant building shall be subject to plan review and reinspection. Upon an inspector's determination that the building complies with the applicable standards, the inspector shall provide to the department the information as required on the data plate for the building and identify the building as satisfactory for use as an educational facility on the building code information system.

428.7.3 New construction. All buildings other than existing buildings shall be subject to inspection during the manufacturing process. The educational entity shall ensure that factory inspections are performed periodically and are sufficient to ensure that the building and its systems comply with the applicable standards. The inspector shall require the correction of all deficiencies found during the manufacturing process. Upon an inspector's determination that the building complies with the applicable standards, the inspector shall provide to the department the information as required on the data plate for the building and identify the building as satisfactory for use as an educational facility on the building code information system.

**SECTION 429
BOOT CAMPS FOR CHILDREN**

429.1 Boot camps for children shall comply with the design and construction standards as described herein. Enforcement and interpretation of these provisions shall be by the entities authorized by Chapter 553.80, *Florida Statutes*.

Note: Other administrative and programmatic provisions may apply. See Department of Juvenile Justice Rule 63-E 2, *Florida Administrative Code*, and Chapter 39, *Florida Statutes*.

429.2 Facility structural and operational standards.

429.2.1 The facility shall conform to the *Florida Fire Prevention Code*. All new construction and building renovations shall comply with the *Florida Building Code*.

429.2.2 All juvenile justice residential treatment program facilities shall conform to the *Florida Building Code*.

429.2.3 All juvenile justice residential treatment program facilities shall comply with the sanitation, health and fire codes set forth in the *Florida Building Code* and in the *Florida Fire Prevention Code*.

**SECTION 430
MAUSOLEUMS AND COLUMBARIUMS**

430.1 General. The provisions of Section 430 shall apply to buildings or structures as defined in Section 202 as chapel mausoleums, garden mausoleums, nonvisitation crypt mausoleums, and columbariums. All crypts and niches built after this code becomes effective shall conform to this code.

430.2 Occupancy classification. Mausoleums and columbariums shall be classified as a Group S2 low hazard storage occupancy.

430.3 Construction type. Mausoleums, columbariums and accessory occupancies shall be of Type I unsprinklered, Type II unsprinklered, or Type IIB unsprinklered construction.

430.4 Accessory occupancies. Accessory occupancies shall comply with Sections 302.1 and 302.2.

430.5 Structural loads. Mausoleums and columbariums shall be designed to comply with the structural design requirements of Chapter 16. Crypts shall be designed for a minimum total live load of 35 psf (2kN/m²).

430.6 Mausoleum and columbarium construction. The design and construction of mausoleums and columbariums shall comply with the *Florida Building Code, Building* and Section 430.6.

430.6.1 Plumbing systems. Mausoleums and columbariums shall not be required to comply with the *Florida Building Code, Plumbing*.

Exception: Accessory areas and an occupancy in a mixed occupancy building shall comply with *Florida Building Code, Plumbing*. The number and location of plumbing facilities shall be based on the accessory areas and the mixed occupancy areas.

430.6.2 Mechanical systems. Mausoleums and columbariums shall not be required to comply with the *Florida Building Code, Mechanical*.

Exceptions:

1. Accessory areas and an occupancy in a mixed occupancy building shall comply with *Florida Building Code, Mechanical*. Mechanical systems shall be based on the accessory areas and the mixed occupancy areas.
2. Crypt pressure relief system shall comply with Section 430.7.2 except that for family mausoleum units where all crypts are bordering an exterior wall, pressure relief ventilation shall be provided from the crypt to the outside of the mausoleum through the exterior wall or roof.
3. Niches shall not require pressure relief systems.

430.6.3 Fire protection systems. Mausoleums and columbariums shall not be required to comply with Chapter 9, Fire Protection Systems.

Exception: Accessory areas and an occupancy in a mixed occupancy building shall comply with Chapter 9. The fire protection systems shall be based on the accessory areas and the mixed occupancy areas.

430.6.4 Interior finish. The interior finish for mausoleums and columbariums shall be Class A for exits and exit access and Class B for other spaces. The floor tile, marble, and granite used in a chapel mausoleum shall comply with the Marble Institute of America (1998).

430.6.5 Exterior finish. The exterior finish for mausoleums and columbariums shall be one or more of the following finishes:

- Granite
- Marble
- Rubbed concrete
- Painted concrete
- Stucco
- Synthetic stucco
- Waterproofing products
- Tile

430.7 Crypts.

430.7.1 Crypts construction. Crypts and companion crypts shall be constructed of reinforced concrete complying with Chapter 19 and 430.7.1.

430.7.1.1 Cast in place crypt. Cast in place crypts shall have a minimum thickness of 3 inches (76 mm) for floor slabs, walls, and other structural framework.

430.7.1.2 Precast crypt. Concrete shall have a minimum specified compressive strength f'_c of 5,000 psi (34.5 mPa). Crypt floor slabs and roof slabs shall have a minimum thickness of 2½ inches (63.5 mm). Crypt walls shall be a minimum thickness of 3½ inches (88.9 mm) at the top of the wall to a minimum of 2 inches (50.8 mm) at the bottom of the wall.

430.7.1.3 Crypt front. Crypt fronts are to be independent of the crypt panel. The front shall be Grade A exterior type granite or marble according to the Marble Institute of America (1998), or travertine, or bronze, or tile mosaic. The front shall be installed with a hanger system. The hangers, clips, and other exterior or interior fastenings shall be of copper-based alloy, copper, or stainless steel designed for strength and durability. Aluminum fastenings may be used if they will not react with any material or metal that they may come in contact with and when not embedded in concrete. The front, trim, and wall stone shall be a minimum ¾ inch (19.1 mm) thick, other materials used for crypt fronts shall be the thickness as dictated at the time by modern mausoleum construction.

430.7.2 Crypt relief vent. For family mausoleum units where all crypts are bordering an exterior wall, pressure relief ventilation shall be provided from the crypt to the outside of the mausoleum through the exterior wall or roof. For all other mausoleum units, each crypt shall have a pressure relief vent from the crypt to the roof of the mausoleum complying with Section M515, Mausoleum relief system, of the *Florida Building Code, Mechanical*. Niches shall not require pressure relief systems.

430.8 Casket placement. Casket placement shall have minimum interior dimensions of 2 feet 6 inches (762 mm) wide mm) by 2 feet 1 inch (635 mm) high by 7 feet 3½ inches (2223 mm) deep.

430.9 Niches. Niches shall be designed and constructed in accordance with Section 430.9.

430.9.1 Minimum size. Niches shall have a minimum volume of 200 cubic inches (7 m³) with a minimum width of 4½ inches (114.3 mm), a minimum height of 9 inches (228.6 mm), and a minimum depth of 5 inches (127 mm).

430.9.2 Niche front. The niche front shall be Grade A exterior-type granite or marble according to the marble Institute of America (1998), or travertine, bronze, tile mosaic, glass, lexan, or plexiglass.

430.9.3 Pressure relief systems. Niches shall not require pressure relief systems.

430.9.4 Wall thickness. Niche wall thickness shall be the thickness as dictated at the time of construction by modern mausoleum and columbarium construction.

430.10 Family mausoleum. Family mausoleums consisting of six or fewer casket placements shall comply with either Sections 430.1 or 430.10.

430.10.1 Materials. Family mausoleums shall be constructed of the materials in Sections 430.10.1.1 through 430.10.1.6.

430.10.1.1 Reinforced concrete floor. Reinforced concrete floor shall have a minimum specified compressive strength f'_c of 5,000 psi (34.5 mPa).

430.10.1.2 Hardware. Hardware and fasteners shall be of stainless steel or bronze.

430.10.1.3 Doors. When installed, doors and door hardware shall be bronze.

430.10.1.4 Crypt front. Crypt fronts shall be granite or marble.

430.10.1.5 Walls and roof. Walls and roof shall be of granite, marble or reinforced concrete.

430.10.1.6 Floor. The floor shall be granite, marble, or reinforced concrete.

430.10.2 Crypt relief vent. For family mausoleum units where all crypts are bordering an exterior wall, pressure relief ventilation shall be provided from the crypt to the outside of the mausoleum through the exterior wall or roof.

For family mausoleum units where all crypts are not bordering an exterior wall, each crypt shall have a pressure relief vent from the crypt to the roof of the mausoleum complying with Section M515, Mausoleum relief system, of the *Florida Building Code, Mechanical*.

430.10.3 minimum thickness. The minimum thickness for the components of a family mausoleum shall comply with Section 430.10.3.

430.10.3.1 Family mausoleum. Exterior walls shall be a minimum of 4 inches (101.6 mm). Roof shall be minimum of 6 inches (152 mm). Floor shall be a minimum of 6 inches (152 mm) granite, marble, or reinforced concrete. Shelves shall be a minimum of 2 inches (51 mm). Crypt fronts shall be a minimum of ¾ inch (19.1 mm).

430.10.3.2 Burial chamber mausoleum. Exterior walls shall be a minimum of 6 inches (152 mm). Roof shall be a minimum of 6 inches (152 mm). Floor shall be a mini-

imum of 8 inches (203 mm) granite. Shelves shall be a minimum of 2 inches (51 mm). Crypt fronts shall be a minimum of ¼ inch (19.1 mm).

SECTION 431 TRANSIENT PUBLIC LODGING ESTABLISHMENTS

431.1 Any transient public lodging establishment, as defined in Chapter 509, *Florida Statutes*, and used primarily for transient occupancy as defined in Section 83.43(10), *Florida Statutes*, or any timeshare unit of a timeshare plan as defined in Chapters 718 and 721, *Florida Statutes*, which is of three stories or more and for which the construction contract has been let after the effective date of this code, with interior corridors which do not have direct access from the guest area to exterior means of egress and on buildings over 75 feet (22 860 mm) in height that have direct access from the guest area to exterior means of egress and for which the construction contract has been let after the effective date of this code, shall be equipped with an automatic sprinkler system installed in compliance with the provisions prescribed in the NFPA 13, *Standards for the Installation of Sprinkler Systems*. Each guestroom and each timeshare unit shall be equipped with an approved listed single-station smoke detector meeting the minimum requirements of NFPA 74, *Standards for the installation, maintenance and Use of Household Fire Warning Equipment*, powered from the building electrical service, notwithstanding the number of stories in the structure, if the contract for construction is let after the effective date of this code. Single-station smoke detectors shall not be required when guest-rooms or timeshare units contain smoke detectors connected to a central alarm system which also alarms locally.

SECTION 432 USE OF ASBESTOS IN NEW PUBLIC BUILDINGS OR BUILDINGS NEWLY CONSTRUCTED FOR LEASE TO GOVERNMENT ENTITIES-PROHIBITION

432.1 The use of asbestos or asbestos-based fiber materials is prohibited in any building, construction of which is commenced after September 30, 1983, which is financed with public funds or is constructed for the express purpose of being leased to any governmental entity.

SECTION 433 ADULT DAY CARE

433.1 General. Adult day care facilities shall comply with the following design and construction standards.

Note: See Agency for Health Care Administration (AHCA) Rule 58A-6, *Florida Administrative Code*, and Chapter 400, Part V, *Florida Statutes*.

433.2 Definitions.

“**Adult day care center**” or “**center**” means any building, buildings, or part of a building, whether operated for profit or not, in which is provided through its ownership or management, for a part of a day, basic services to three or more persons who are 18 years of age or older, who are not related to

the owner or operator by blood or marriage, and who require such services. The following are exempt from this part:

1. Any facility, institution, or other place that is operated by the federal government or any agency thereof.
2. Any freestanding inpatient hospice facility that is licensed by the state and which provides day care services to hospice patients only.
3. A licensed assisted living facility, a licensed hospital, or a licensed nursing home facility that provides services during the day which include, but are not limited to, social, health, therapeutic, recreational, nutritional and respite services, to adults who are not residents, so long as the facility does not hold itself out as an adult day care center.

“**Capacity**” shall mean the number of participants for which a center has been licensed to provide care at any given time and shall be based upon required net floor space.

“**Net floor space**” shall mean the actual climatically controlled occupied area, not including accessory unoccupied areas such as hallways, stairs, closets, storage areas, bathrooms, kitchen or thickness of walls, set aside for the use of the day care center participants.

“**Participant space**” shall mean the required net floor space per participant. Maximum participant capacity shall refer to the licensed capacity.

433.3 The following minimum conditions shall be met:

433.3.1 The floor surface in kitchens, all rooms and areas in which food is stored or prepared and in which utensils are washed or stored shall be of smooth nonabsorbent material and constructed so it can be easily cleaned and shall be washable up to the highest level reached by splash or spray.

433.3.2 The walls and ceilings of all food preparation, utensil washing and hand washing rooms or areas shall have smooth, easily cleanable surfaces. Walls shall be washable up to the highest level reached by splash or spray.

433.3.3 Hot and cold running water under pressure shall be easily accessible to all rooms where food is prepared or utensils are washed.

433.3.4 Hand-washing facilities, provided with hot and cold running water, shall be located within the food preparation area in new adult day care facilities and adult day care facilities which are extensively altered.

433.3.5 Multiuse equipment and utensils shall be constructed and repaired with materials that are nontoxic, corrosion resistant and nonabsorbent; and shall be smooth, easily cleanable and durable under conditions of normal use; and shall not impart odors, color or taste nor contribute to the contamination of food.

433.3.6 A three-compartment sink or a two-compartment sink and a dishwasher with an effective, automatic sanitizing cycle, shall be provided.

433.3.7 Refrigeration units and hot food storage units used for the storage of potentially hazardous foods shall be provided with a numerically scaled indicating thermometer accurate to plus or minus 3°F (-16°C). The thermometer

shall be located in the warmest or coldest part of the units and of such type and so situated that the temperature can be easily and readily observed.

433.4 Participant and program data, emergency procedures. Fire safety protection shall be governed in accordance with the *Florida Fire Prevention Code*.

433.5 Physical plant, sanitary conditions, housekeeping standards and maintenance.

433.5.1 The participant capacity shall be determined by the total amount of net floor space available for all of the participants. Centers shall provide not less than 45 square feet (4 m²) of net floor area per participant. Centers shall be required to provide additional floor space for special target populations to accommodate activities required by participant care plans.

433.5.2 Facilities exempt pursuant to Section 400.553, *Florida Statutes*, shall utilize separate space over and above the minimum requirement needed to meet their own licensure certification approval requirements. Only congregate space shall be included in determining minimum space. For purposes of this section, congregate space shall mean climatically controlled living room, dining room, specialized activity rooms, or other rooms to be commonly used by all participants.

433.5.3 Center facilities shall consist of, but not be limited to, the following:

1. Bathrooms.
2. Dining areas.
3. Kitchen areas.
4. Rest areas.
5. Recreation and leisure time areas.

433.5.4 A private area shall be available for the provision of first aid, special care and counseling services when provided, or as necessary for other services required by participants. This area shall be appropriately furnished and equipped.

433.5.5 Bathrooms shall be ventilated and have hot and cold running water, supplying hot water at a minimum of 105°F (41°C) and a maximum of 115°F (46°C).

433.5.6 Recreation and leisure time areas shall be provided where a participant may read, engage in socialization or other leisure time activities. The recreation areas also may be utilized for dining areas.

433.5.7 All areas used by participants shall be suitably lighted and ventilated and maintained at a minimal inside temperature of 72°F (22°C) when outside temperatures are 65°F (18°C) or below, and all areas used by participants must not exceed 90°F (32°C). Mechanical cooling devices must be provided when indoor temperatures exceed 84°F (29°C). The facility shall have a thermometer which accurately identifies the temperature.

SECTION 434 ASSISTED LIVING FACILITIES

434.1 Scope. Assisted living facilities shall comply with the following design and construction standards as described herein.

Note: Other administrative and programmatic provisions may apply. See Agency of Health Care Administration (AHCA) Rule 58A-5, *Florida Administrative Code* and Chapter 400 Part III, *Florida Statutes*.

434.2 Definitions.

AGENCY. The Agency for Health Care Administration.

ASSISTED LIVING FACILITY. Any building or buildings, section or distinct part of a building, private home, boarding home, home for the aged or other residential facility, whether operated for profit or not, which undertakes through its ownership or management to provide housing, meals and one or more personal services for a period exceeding 24 hours to one or more adults who are not relatives of the owner or administrator. The following are exempted from this definition:

1. Any facility, institution, or other place operated by the federal government or any agency of the federal government.
2. Any facility or part of a facility licensed under Chapter 393, *Florida Statutes*, or Chapter 394, *Florida Statutes*.
3. Any facility licensed as an adult family care home under Part VII Chapter 400, *Florida Statutes*.
4. Any person who provides housing, meals and one or more personal services on a 24-hour basis in the person's own home to not more than two adults who do not receive optional state supplementation. The person who provides the housing, meals, and personal services must own or rent the home and reside therein.
5. Any home or facility approved by the United States Department of Veterans Affairs as a residential care home wherein care is provided exclusively to three or fewer veterans.
6. Any facility that has been incorporated in this state for 50 years or more on or before July 1, 1983, and the board of directors of which is nominated or elected by the residents, until the facility is sold or its ownership is transferred; or any facility, with improvements or additions thereto, which has existed and operated continuously in this state for 60 years or more on or before July 1, 1989, is directly or indirectly owned and operated by a nationally recognized fraternal organization, is not open to the public, and accepts only its own members and their spouses as residents.
7. Any facility certified under Chapter 651, *Florida Statutes*, or a retirement community, may provide services authorized under this section or Part IV of Chapter 400, *Florida Statutes* to its residents who live in single-family homes, duplexes, quadruplexes, or apartments located on the campus without obtaining a license to operate an assisted living facility if residential units

within such buildings are used by residents who do not require staff supervision for that portion of the day when personal services are not being delivered and the owner obtains a home health license to provide such services. However, any building or distinct part of a building on the campus that is designated for persons who receive personal services and require supervision beyond that which is available while such services are being rendered must be licensed in accordance with this section. If a facility provides personal services to residents who do not otherwise home health agency, the buildings or distinct parts of buildings where such services are rendered must be licensed under this section. A resident of a facility that obtains a home health license may contract with a home health agency of his or her choice, provided that the home health agency provides liability insurance and workers' compensation coverage for its employees. Facilities covered by this exemption may establish policies that give residents the option of contracting for services and care beyond that which is provided by the facility to enable them to age in place. For purposes of this section, a retirement community consists of a facility licensed under this section or under Part II of Chapter 400, *Florida Statutes*, and apartments designed for independent living located on the same campus.

8. Any residential unit for independent living which is located within a facility certified under Chapter 651 *Florida Statutes*, or any residential unit which is colocated with a nursing home licensed under Part II of Chapter 400 *Florida Statutes*, or colocated with a facility licensed under this section in which services are provided through an outpatient clinic or a nursing home on an outpatient basis.

DEPARTMENT. The Department of Elderly Affairs.

EXTENDED CONGREGATE CARE. Acts beyond those authorized in subsection (5) that may be performed pursuant to part I of Chapter 464, *Florida Statutes*, by persons licensed thereunder while carrying out their professional duties. The purpose of such services is to enable residents to age in place in a residential environment despite mental or physical limitations that might otherwise disqualify them from residency in a facility licensed under this part.

PERSONAL SERVICES. Direct physical assistance with or supervision of the activities of daily living and the self-administration of medication and other similar services which the department may define by rule. Personal services shall not be construed to mean the provision of medical, nursing, dental or mental health services.

RELATIVE. An individual who is the father, mother, stepfather, stepmother, son, daughter, brother, sister, grandmother, grandfather, great-grandmother, great-grandfather, grandson, granddaughter, uncle, aunt, first cousin, nephew, niece, husband, wife, father-in-law, mother-in-law, son-in-law, daughter-in-law, brother-in-law, sister-in-law, stepson, stepdaughter, stepbrother, stepsister, half brother or half sister of an owner or administrator.

RESIDENT. A person 18 years of age or older, residing in and receiving care from a facility.

RESIDENT'S REPRESENTATIVE OR DESIGNEE. A person other than the owner, or an agent or employee of the facility, designated in writing by the resident, if legally competent, to receive notice of changes in the contract executed pursuant to Section 400.424, *F.S.*; to receive notice of and to participate in meetings between the resident and the facility owner, administrator or staff concerning the rights of the resident; to assist the resident in contacting the ombudsman council if the resident has a complaint against the facility; or to bring legal action on behalf of the resident pursuant to Section 400.429, *Florida Statutes*.

AHCA CENTRAL OFFICE. The Assisted Living Unit, Agency for Health Care Administration.

CAPACITY. The number of residents for which a facility has been licensed to provide residential care.

DISTINCT PART. Designated bedrooms or apartments, bathrooms and a living area; or a separately identified wing, floor or building which includes bedrooms or apartments, bathrooms and a living area. The distinct part may include a separate dining area, or meals may be served in another part of the facility.

DOEA ASSISTED LIVING PROGRAM. The Assisted Living Program, Department of Elder Affairs.

FOOD SERVICE. The storage, preparation, serving and cleaning up of food intended for consumption in a facility or a formal agreement that meals will be regularly catered by a third party.

RENOVATION. Additions, repairs, restorations or other improvements to the physical plant of the facility within a five-year period that costs in excess of 50 percent of the value of the building as reported on the tax rolls, excluding land, before the renovation.

434.3 Codes and standards for the design and construction of assisted living facilities. Except as modified and required by this section of the code, Chapter 58A-5, *Florida Administrative Code* or Chapter 429 Part III, *Florida Statutes*, all new assisted living facilities and all additions, alterations, or renovations to existing assisted living facilities with more than 16 licensed beds shall also be in compliance with *The Guidelines for the Design and Construction of Health Care Facilities* (The Guidelines) Part I General, and Chapter 4.3 Assisted Living of Part 4, Other Health Care Facilities, incorporated by reference and obtainable from the American Institute of Architects, 1735 New York Ave., N.W., Washington, D.C. 20006-5292.

434.4 Additional physical plant requirements for assisted living facilities. In addition to the codes and standards referenced in Section 434.3 of the code, the following minimum essential facilities shall apply to all new assisted living facilities.

434.4.1 Indoor radon testing as mandated by Section 404.056(5), *Florida Statutes*, shall be completed by all facilities.

434.4.2 Heating and cooling.

434.4.2.1 When outside temperatures are 65°F (18°C) or below, an indoor temperature of at least 72°F (22°C)

shall be maintained in all areas used by residents during hours when residents are normally awake. During night hours when residents are asleep, an indoor temperature of at least 68°F (20°C) shall be maintained.

434.4.2.2 During hours when residents are normally awake, mechanical cooling devices, such as electric fans, must be used in those areas of buildings used by residents when inside temperatures exceed 85°F (29°C) provided outside temperatures remain below 90°F (32°C). No residents shall be in any inside area that exceeds 90°F (32°C). However, during daytime hours when outside temperatures exceed 90°F (32°C), and at night, an indoor temperature of no more than 81°F (27°C) must be maintained in all areas used by residents.

434.4.2.3 Residents who have individually controlled thermostats in their bedrooms or apartments shall be permitted to control temperatures in those areas.

434.4.3 Common areas.

434.4.3.1 A minimum of 35 square feet (3 m²) of living and dining space per resident, live-in staff and live-in family member shall be provided except in facilities comprised of apartments. This space shall include living, dining, recreational or other space designated accessible to all residents, and shall not include bathrooms, corridors, storage space or screened porches which cannot be adapted for year round use. Facilities with apartments may count the apartment's living space square footage as part of the 35 square footage (3 m²) living and dining space requirement.

Those facilities also serving as adult day care centers must provide an additional 35 square feet (3 m²) of living and dining space per adult day care client. Excess floor space in residents' bedrooms or apartments cannot be counted toward meeting the requirement of 35 square feet (3 m²) of living and dining space requirements for adult day care participants. Day care participants may not use residents' bedrooms for resting unless the room is currently vacant.

434.4.3.2 A room, separate from resident bedrooms, shall be provided where residents may read, engage in socialization or other leisure time activities. Comfortable chairs or sofas shall be provided in this communal area.

434.4.3.3 The dining area shall be furnished to accommodate communal dining.

434.4.4 Bedrooms.

434.4.4.1 Resident sleeping rooms designated for single occupancy shall provide a minimum inside measurement of 80 square feet of usable floor space. Usable floor space does not include closet space or bathrooms.

434.4.4.2 Resident bedrooms designated for multiple occupancy shall provide a minimum inside measurement of 60 square feet (6 m²) of usable floor space per room occupant.

434.4.4.3 Resident bedrooms designated for multiple occupancy in facilities newly licensed or renovated six

months after October 17, 1999, shall have a maximum occupancy of two persons.

434.4.4.4 All resident bedrooms shall open directly into a corridor, common use area or to the outside. A resident must be able to exit his bedroom without having to pass through another bedroom unless the two rooms have been licensed as one bedroom.

434.4.4.5 All resident bedrooms shall be for the exclusive use of residents. Live-in staff and their family members shall be provided with sleeping space separate from the sleeping and congregate space required for residents.

434.4.5 Bathrooms.

434.4.5.1 There shall be at least one bathroom with one toilet and sink per six persons, and one bathtub or shower per eight persons. All residents, all live-in staff and family members, and respite care participants must be included when calculating the required number of toilets, sinks, bathtubs and showers. All adult day care participants shall be included when calculating the required number of toilets and sinks.

434.4.5.2 Each bathroom shall have a door in working order to assure privacy. The entry door to bathrooms with a single toilet shall have a lock which is operable from the inside by the resident with no key needed. A nonlocking door shall be permitted if the resident's safety would otherwise be jeopardized.

434.4.5.3 There shall be nonslip safety devices such as bath mats or peel off stickers in the showers and bathtubs of all facilities. Showers and bathtubs with a nonskid surface require a separate nonskid device only if the surface is worn. Grab bars shall be required in showers and bathtubs. Grab bars, whether portable or permanent, must be securely affixed to the floor or adjoining walls. Facilities newly licensed or renovated six months after October 17, 1999 must have grab bars next to the commode.

434.4.5.4 Sole access to a toilet or bathtub or shower shall not be through another resident's bedroom, except in apartments within a facility.

434.4.6 Security. External boundaries of a facility or a distinct part of a facility, including outside areas, may be secured using egress control or perimeter control devices if the following conditions are met.

434.4.6.1 The use of the device complies with all lifesafety requirements.

434.4.6.2 Residents residing within a secured area are able to move freely throughout the area, including the resident's bedroom or apartment, bathrooms and all common areas, and have access to outdoor areas on a regular basis and as requested by each resident.

434.4.6.3 Residents capable of entering and exiting without supervision have keys, codes or other mechanisms to exit the secured area without requiring staff assistance.

434.4.6.4 Staff who provide direct care or who have regular contact with residents residing in secured areas com-

plete Level 1 Alzheimer's training as described in Rule 58A-5.0191.

434.4.6.5 Pursuant to Section 400.441, *Florida Statutes*, facilities with 16 or fewer residents shall not be required to maintain an accessible telephone in each building where residents reside, maintain written staff job descriptions, have awake night staff or maintain standardized recipes as provided in Rules 58A-5.0182(6)(g), 58A-5.019(2)(e), 58A-5.019(4)(a) and 58A-5.020(2)(b), respectively.

434.5 Extended congregate care.

434.5.1 Physical site requirements. Each extended congregate care facility shall provide a homelike physical environment which promotes resident privacy and independence including:

434.5.1.1 A private room or apartment, or a semiprivate room or apartment shared with roommate of the resident's choice. The entry door to the room or apartment shall have a lock which is operable from the inside by the resident with no key needed. The resident shall be provided with a key to the entry door on request. The resident's service plan may allow for a nonlocking entry door if the resident's safety would otherwise be jeopardized.

434.5.1.2 A bathroom, with a toilet, sink and bathtub or shower, which is shared by a maximum of four residents. A centrally located hydromassage bathtub may substitute for the bathtub or shower in two of the bath rooms. The entry door to the bathroom shall have a lock which is operable from the inside by the resident with no key needed. The resident's service plan may allow for a nonlocking bathroom door if the resident's safety would otherwise be jeopardized.

SECTION 435 CONTROL OF RADIATION HAZARDS

435.1 Scope. Control of radiation hazards shall comply with the following design and construction standards as described herein.

Note: Other administrative and programmatic provisions may apply. See Department of Health (DOH) Rule 64E-5, *Florida Administrative Code*, and Chapter 404, *Florida Statutes*.

435.2 Control of access to high radiation areas.

435.2.1 Definitions.

HIGH RADIATION AREA. An area, accessible to individuals, in which radiation levels from radiation sources external to the body could result in an individual receiving a dose equivalent in excess of 1 mSv (0.1 rem) in 1 hour at 30 cm from any source of radiation or from any surface that the radiation penetrates. For purposes of this section, rooms or areas in which diagnostic X-ray systems are used for healing arts purposes are not considered high radiation areas.

VERY HIGH RADIATION AREA. An area, accessible to individuals, in which radiation levels from radiation sources external to the body could result in an

individual receiving an absorbed dose in excess to 500 rad (5 gray) in 1 hour at 1 m from a source of radiation or from any surface that the radiation penetrates. At very high doses received at high dose rates, units of absorbed dose, gray and rad, are appropriate, rather than units of dose equivalent, sievert and rem.

435.2.2 The licensee or registrant shall ensure that each entrance or access point to a high radiation area has one or more of the following features:

435.2.2.1 A control device that upon entry into the area causes the level of radiation to be reduced below that level at which an individual might receive a deep dose equivalent of 0.1 rem (1 millisievert) in 1 hour at 30 cm from the source of radiation from any surface that the radiation penetrates;

435.2.2.2 A control device that energizes a conspicuous visible or audible signal so that the individual entering the high radiation area and the supervisor of the activity are made aware of the entry; or

435.2.2.3 Entryways that are locked except during periods when access to the areas is required with positive control over each individual entry.

435.3 Caution signs.

435.3.1 Standard radiation symbol. Unless otherwise authorized by the department, the symbol prescribed in this section shall use the colors magenta or purple or black on yellow background. The symbol prescribed is the three-bladed design as follows:

435.3.1.1 Radiation symbol.

435.3.1.1.1 Cross-hatched area is to be magenta or purple or black.

435.3.1.1.2 The background is to be yellow.

435.3.2 Exception to color requirements for standard radiation symbol. In spite of the requirements of Section 435.3.1, licensees or registrants are authorized to label sources, source holders or device components containing sources of radiation that are subjected to high temperatures, with conspicuously etched or stamped radiation caution symbols and without a color requirement.

435.3.3 Additional information on signs and labels. In addition to contents of signs and labels prescribed in this part, the licensee or registrant shall provide on or near the required signs and labels additional information to make individuals aware of potential radiation exposures and to minimize the exposures.

435.4 Posting requirements.

435.4.1 Posting of radiation areas. The licensee or registrant shall post each radiation area with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIATION AREA."

435.4.2 Posting of high radiation areas. The licensee or registrant shall post each high radiation area with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, HIGH RADIATION AREA" or "DANGER, HIGH RADIATION AREA."

435.4.3 Posting of very high radiation areas. The licensee or registrant shall post each very high radiation area with a conspicuous sign or signs bearing the radiation symbol and words “GRAVE DANGER, VERY HIGH RADIATION AREA.”

435.4.4 Posting of air-borne radioactivity areas. The licensee shall post each air-borne radioactivity area with a conspicuous sign or signs bearing the radiation symbol and the words “CAUTION, AIR-BORNE RADIOACTIVITY AREA” or “DANGER, AIR-BORNE RADIOACTIVITY AREA.”

435.4.5 Posting of areas or rooms in which licensed material is used or stored. The licensee shall post each area or room in which there is used or stored an amount of licensed material exceeding 10 times the quantity of such material specified in State of Florida Office of Radiation Control Radioactive Material Requiring Labeling, May 2000, which is herein incorporated by reference and which is available from the department, with a conspicuous sign or signs bearing the radiation symbol and the words “CAUTION, RADIOACTIVE MATERIAL(S)” or “DANGER, RADIOACTIVE MATERIAL(S).”

435.4.6 A licensee or registrant is not required to post caution signs in areas or rooms containing sources of radiation for periods of less than 8 hours if each of the following conditions is met.

435.4.6.1 The sources of radiation are constantly attended during these periods by an individual who takes the precautions necessary to prevent the exposure of individuals to sources of radiation in excess of the limits established in this section, and

435.4.6.2 The area or room is subject to the licensee’s or registrant’s control.

435.4.7 Rooms or other areas in hospitals that are occupied by patients are not required to be posted with caution signs as specified in 64E-5.323 if the patient could be released from confinement as specified in 64E-5.622.

435.4.8 A room or area is not required to be posted with a caution sign because of the presence of a sealed source provided the radiation level at 30 cm from the surface of the sealed source container or housing does not exceed 0.005 rem (0.05 millisievert) per hour.

435.4.9 A room or area is not required to be posted with a caution sign because of the presence of radiation machines used solely for diagnosis in the healing arts.

435.5 General requirements.

435.5.1 Shielding. Each X-ray facility shall have primary and secondary protective barriers as needed to assure that an individual will not receive a radiation dose in excess of the limits specified in Part III of Chapter 64E-5, *Florida Administrative Code*.

435.5.1.1 Structural shielding in walls and other vertical barriers required for personnel protection shall extend without breach from the floor to a height of at least 7 feet (2.1 m).

435.5.1.2 Doors, door frames, windows and window frames shall have the same lead equivalent shielding as

that required in the wall or other barrier in which they are installed.

435.5.1.3 Prior to construction, the floor plans and equipment arrangement of all new installations, or modifications of existing installations, utilizing X-ray energies of 200 keV and above for diagnostic or therapeutic purposes shall be submitted to the Department of Health for review and approval. In computation of protective barrier requirements, the maximum anticipated workload, use factors, occupancy factors and the potential for radiation exposure from other sources shall be taken into consideration.

435.5.1.3.1 The plans shall show, as a minimum, the following:

435.5.1.3.1.1 The normal location of the X-ray system’s radiation port; the port’s travel and traverse limits; general direction of the useful beam; locations of any windows and doors; the location of the operator’s booth; and the location of the X-ray control panel.

435.5.1.3.1.2 The structural composition and thickness or lead equivalent of all walls, doors, partitions, floor and ceiling of the room concerned.

435.5.1.3.1.3 The dimensions of the room concerned.

435.5.1.3.1.4 The type of occupancy of all adjacent areas inclusive of space above and below the room concerned. If there is an exterior wall, the distance to the closest area where it is likely that individuals may be present.

435.5.1.3.1.5 The make and model of the X-ray equipment and the maximum technique factors.

435.5.1.3.1.6 The type of examinations or treatments which will be performed with the equipment.

435.5.1.3.2 Information shall be submitted on the anticipated maximum workload of the X-ray system.

435.5.1.3.3 If the services of a qualified person have been utilized to determine the shielding requirements, a copy of the report, including all basic assumptions used, shall be submitted with the plans.

435.5.2 X-ray film processing facilities.

435.5.2.1 Processing facilities. Each installation using a radiographic X-ray system shall provide suitable equipment for handling and processing radiographic film in accordance with the following provisions:

435.5.2.1.1 The area in which undeveloped films are handled for processing shall be devoid of light with the exception of light in the wave lengths having no significant effect on the radiographic film.

435.5.2.1.2 Film pass boxes, if provided, shall be so constructed as to exclude light when film is placed in or removed from the boxes, and shall incorporate adequate shielding to prevent exposure of undeveloped film to stray radiation.

435.5.2.1.3 Darkrooms used by more than one individual shall be provided a positive method to prevent accidental entry while undeveloped films are being handled or processed.

435.5.2.1.4 Where film is developed manually, the following conditions shall be met:

435.5.2.1.4.1 At least one trisectional tank made of mechanically rigid, corrosion resistant material shall be utilized; and

435.5.2.1.4.2 The temperature of each solution shall be maintained within the range of 600°F to 800°F (160°C to 270°C). Film shall be developed in accordance with the time-temperature relationships specified by the film manufacturer, or, in the absence of such recommendations by the film manufacturer, with the following time-temperature chart:

435.5.2.1.4.3 Devices shall be utilized which will:

1. Indicate the actual temperature of the developer; and
2. Signal the passage of a preset time as short as 2 minutes.

435.6 Doors, interlocks, and warning systems.

435.6.1 A licensee shall control access to the teletherapy room by a door at each entrance.

435.6.2 A licensee shall equip each entrance to the teletherapy room with an electrical interlock system that shall:

1. Prevent the operator from turning on the primary beam of radiation unless each treatment room entrance door is closed;
2. Turn off the beam of radiation immediately when an entrance door is opened; and
3. Prevent the primary beam of radiation from being turned on following an interlock interruption until all treatment room entrance doors are closed and the beam on-off control is reset at the console.

435.6.3 A licensee shall equip each entrance to the teletherapy room with a conspicuously visible beam condition indicator light.

435.7 Radiation monitoring devices.

435.7.1 A licensee shall have a permanent radiation monitor in each teletherapy room capable of continuously monitoring beam status.

435.7.2 Each radiation monitor shall be capable of providing visible notice of a teletherapy unit malfunction that results in an exposed or partially exposed source. The visible indicator of high radiation levels shall be observable by an individual entering the teletherapy room.

TIME-TEMPERATURE CHART

Thermom Reading (Degrees)		Minimum Developing Time (minutes)
C	F	
26.7	80	2
26.1	79	2
25.6	78	2-1/2
25.0	77	2-1/2
24.4	76	3
23.9	75	3
23.3	74	3-1/2
22.8	73	3-1/2
22.2	72	4
21.7	71	4
21.1	70	4-1/2
20.6	69	4-1/2
20.0	68	5
19.4	67	5-1/2
18.9	66	5-1/2
18.3	65	6
17.8	64	6-1/2
17.2	63	7
16.7	62	8
16.1	61	8-1/2
15.6	60	9-1/2

435.7.3 Each radiation monitor shall be equipped with a backup power supply separate from the power supply to the teletherapy unit. This backup power supply may be a battery system.

435.8 Viewing systems. A licensee shall construct or equip each teletherapy room to permit continuous observation of the patient from the teletherapy unit console during irradiation.

435.9 Warning devices.

435.9.1 All locations designated as high radiation areas, and all entrances to such locations shall be equipped with easily observable warning lights that operate when and only when radiation is being produced.

435.9.2 Except in facilities designed for human exposure, each high radiation area shall have an audible warning device which shall be activated for 15 seconds prior to the possible creation of such high radiation area. Such warning device shall be clearly discernible in all high radiation areas and in any adjacent radiation areas.

435.9.3 Barriers, temporary or otherwise, and pathways leading to high radiation areas shall be identified in accordance with the Department of Health.

435.10 Design requirements for radiation rooms. Panoramic irradiators shall not be operated unless the following are met:

435.10.1 Each entrance to a radiation room must have a door or other physical barrier to prevent inadvertent entry of personnel while the sources are exposed. Product conveyor systems can serve as barriers as long as they reliably and consistently function as a barrier. It must not be possible to move the sources out of their shielded position if any door or barrier to the radiation room is open. Opening the door or barrier while the sources are exposed must cause the sources to return promptly to their shielded position. The primary entry door must have a lock which is operated by the same key used to control source movement. The doors and barriers must not prevent any individual in the radiation room from leaving.

435.10.2 Each entrance to a radiation room must have an independent backup access control to detect personnel entry while the sources are exposed if the primary access control fails. Entry while the sources are exposed must cause the sources to return to their fully shielded position and also must activate a visible and audible alarm to make the individual entering the room aware of the hazard. The alarm also must alert at least one other individual of the entry who is on site and who is trained to render or summon assistance promptly.

435.10.3 A radiation monitor must be provided to detect the presence of high radiation levels in the radiation room before personnel entry. The monitor must be integrated with personnel access door locks to prevent room access when the monitor detects high radiation levels. The monitor must generate audible and visible alarms if high radiation levels are detected when personnel entry is attempted. The monitor can be located in the entrance or maze but not in the direct radiation beam.

435.10.4 Before sources move from their shielded position, the source control automatically must activate conspicuous visible and audible alarms to alert people in the radiation room that the sources will be moved from their shielded position. The alarms must give individuals enough time to leave the room before the sources leave the shielded position.

435.10.5 Each radiation room must have a clearly visible and readily accessible control which will allow an individual in the room to return the sources to their fully shielded position.

435.10.6 Each radiation room must contain a control which allows the sources to move from the shielded position only if the control has been activated and the door or barrier to the radiation room subsequently has been closed within a preset time.

435.10.7 Each entrance to the radiation room and each entrance to the area within the personnel access barrier of an underwater irradiator must be posted as required by this section. Panoramic irradiators also must be posted as required by this section. The sign can be removed, covered or otherwise made inoperative when the sources are shielded fully.

435.10.8 If the radiation room has roof plugs or other movable shielding, it must not be possible to operate the irradiator unless the shielding is in its proper location. This requirement can be met by interlocks which prevent operation if shielding is not placed properly or by an operating procedure requiring inspection of shielding before operating.

435.10.9 Underwater irradiators must have a personnel access barrier around the pool which must be locked to prevent access when the irradiator is not attended. Only operators and facility management shall have access to keys to the personnel access barrier. There must be an intrusion alarm to detect unauthorized entry when the personnel access barrier is locked. Activation of the intrusion alarm must alert an individual, not necessarily on site, who is prepared to respond or summon assistance.

435.11 Fire protection.

435.11.1 The radiation room at a panoramic irradiator must have heat and smoke detectors. The detectors must activate an audible alarm. The alarm must be capable of alerting a person who is prepared to summon assistance promptly. The sources must become fully shielded automatically and the air handling systems within the radiation room must be disabled automatically if a fire is detected.

435.11.2 The radiation room at a panoramic irradiator must be equipped with a fire suppression or extinguishing system capable of extinguishing a fire without the entry of personnel into the room. The system for the radiation room must have a shutoff valve to control flooding into unrestricted areas.

435.12 Irradiator pools.

435.12.1 Irradiator pools must possess a watertight stainless steel liner or a liner metallurgically compatible with other components in the pool or be constructed so that there is a low likelihood of substantial leakage and have a surface designed to facilitate decontamination and must include a means of safely storing sources during repairs of the pool.

435.12.2 Irradiator pools must have no penetration more than 0.5 m below the normal low water level which could allow water to drain out of the pool. Pipes which have intakes more than 0.5 m below the normal low water level must have siphon breakers to prevent the siphoning of the pool.

435.12.3 A means must be provided to replenish water losses from the pool.

435.12.4 An audible and visible indicator must be provided to indicate if the pool water level is below the normal low water level or above the normal high water level.

435.12.5 Irradiator pools must be equipped with a purification system designed to maintain the water during normal operation at a level of conductance not exceeding 20 microsiemens per centimeter and with a clarity so the sources can be seen clearly.

435.12.6 A physical barrier such as a railing or cover must be used around irradiator pools during normal operation to prevent personnel from accidentally falling into the pool.

The barrier can be removed during maintenance, inspection, and service operations.

435.12.7 If long-handled tools or poles are used in irradiator pools, the radiation dose rate on the handling areas of the tools must not exceed 2 millirem (0.02 millisievert) per hour.

435.13 Design requirements.

435.13.1 Panoramic irradiators shall meet the following design requirements:

435.13.1.1 Shielding. The shielding walls shall be designed to meet generally accepted building code requirements for reinforced concrete and shall design the walls, wall penetrations, and entrance ways to meet the radiation shielding requirements of 64E-5.1407. If the irradiator will use more than 2×10^{17} becquerels (5 million curies) of activity, the licensee shall evaluate the effects of heating of the shielding walls by the irradiator sources.

435.13.1.2 Foundations. The foundation shall be designed with consideration given to soil characteristics to ensure it is adequate to support the weight of the facility.

435.13.1.3 Fire protection. The number, design, locations and spacing of the smoke and heat detectors and extinguishing system shall be appropriate to detect fires and that the detectors are protected from mechanical and radiation damage. The fire extinguishing system shall be designed to provide the necessary discharge patterns, densities, and flow characteristics for complete coverage of the radiation room and that the system is protected from mechanical and radiation damage.

435.13.1.4 Wiring. The electrical wiring and electrical equipment in the radiation room shall be selected to minimize failures due to prolonged exposure to radiation.

435.13.2 Pool irradiators shall meet the following design requirements.

435.13.2.1 Pool integrity. The pool shall be designed to assure that it is leak resistant, that it is strong enough to bear the weight of the pool water and shipping casks, that a dropped cask would not fall on sealed sources, that all penetrations meet the requirements of Section 435.12.2, and that metal components are metallurgically compatible with other components in the pool.

435.13.2.2 Water-handling system. The water purification system shall be designed to meet the requirements of Section 435.12.5. The system must be designed so that water leaking from the system does not drain to unrestricted areas without being monitored. The licensee shall design the water chiller system so that it shall compensate adequately for the amount of heat generated by the sealed sources. The water-handling system must have remote controls capable of safely operating a contaminated system.

435.13.3 Floor penetrations. No floor penetrations, including expansion joints, floor joints and drains, shall allow the uncontrolled release of water from the radiation room that has not been analyzed for its radioactive content.

435.14 Construction control. The requirements of this section must be met before loading sources. Panoramic irradiators shall meet the following construction requirements:

435.14.1 Shielding. The construction of the shielding shall be monitored to verify that it meets design specifications and generally accepted building code requirements for reinforced concrete.

435.14.2 Foundations. The construction of the foundations shall be monitored to verify that they meet design specifications.

435.14.3 Fire protection. The ability of the heat and smoke detectors shall be verified to detect a fire, to activate alarms and to cause the source rack to become fully shielded automatically. The operability of the fire suppression or extinguishing system shall also be verified.

435.14.4 Wiring. The electrical wiring and electrical equipment that were installed shall be verified to meet the design specifications.

435.15 Pool irradiators shall meet the following construction requirements.

435.15.1 Pool integrity. The integrity of the pool shall be tested to verify that the pool meets the design specifications. The penetrations and water intakes shall be verified to meet the requirements of Section 435.12.2.

SECTION 436 DAY-CARE OCCUPANCIES

436.1 General.

436.1.1 Places of religious worship shall not be required to meet the provisions of this section in order to operate a nursery while services are being held in the building.

436.1.2 Where day care occupancies with clients 24 months or less in age or incapable of self-preservation are located one or more stories above the level of exit discharge or where day care occupancies are located two or more stories above the level of exit discharge, smoke barriers shall be provided to divide such stories into a minimum of two smoke compartments. The smoke barriers shall be constructed in accordance with Section 709 but shall not be required to have a fire-resistance rating.

436.2 Closet doors. Every closet door latch shall be such that clients can open the door from inside the closet.

436.3 Bathroom doors. Every bathroom door lock shall be designed to permit opening of the locked door from the outside in an emergency. The opening device shall be readily accessible to the staff.

436.4 Door closure. Any exit door designed to be normally closed shall be kept closed and shall comply with Section 715.3.

436.5 Location and construction types. Day care occupancies shall be limited to the locations and construction types specified in Table 436.5. Day care homes and adult day care shall be permitted to be of any type construction permitted by this code.

**TABLE 436.5
DAY-CARE LOCATION AND TYPE OF CONSTRUCTION**

LOCATION OF DAY CARE	TYPE OF CONSTRUCTION	
	Sprinklered Building	Construction Type
1 story below LED ¹	Yes	I, II, IIIA, IV, V-A
Level of Exit Discharge	No	Any type permitted by this code
1 story above LED ¹	Yes No	Any type
2 or 3 stories above LED ¹	Yes	I, II, III-A, V-A
> 3 stories above LED ¹ but not high rise	Yes	I
High rise	Yes	I

Notes:

¹LED means Level of Exit Discharge.

436.6 Protection from hazards. Rooms or spaces for the storage, processing or use of materials specified below shall be protected in accordance with the following:

436.6.1 The following rooms or spaces shall be separated from the remainder of the building by fire barriers having a fire resistance rating of not less than 1-hour or shall be protected by an approved automatic extinguishing system.

1. Boiler and furnace rooms.

Exception: Rooms enclosing only air-handling equipment.

2. Rooms or spaces used for the storage of combustible supplies in quantities deemed hazardous by the building official.
3. Rooms or spaces used for the storage of hazardous materials or flammable or combustible liquids in quantities deemed hazardous by recognized standards.
4. Janitor closets.

Exception: Doors to janitor closets shall be permitted to have ventilating louvers where the space is protected by automatic sprinklers.

436.6.2 The following rooms or spaces shall be separated from the remainder of the building by fire barriers having a fire resistance rating of not less than 1 hour and shall be protected by an approved automatic fire-extinguishing system.

1. Laundries.
2. Maintenance shops, including woodworking and painting areas.
3. Rooms or spaces used for processing or use of combustible supplies deemed hazardous by the building official.
4. Rooms or spaces used for processing or use of hazardous materials or flammable or combustible liquids in quantities deemed hazardous by recognized standards.

Exception: Food preparation facilities protected in accordance with NFPA 96 shall not be required to have openings protected between food preparation areas and

dining areas. Where domestic cooking equipment is used for food warming or limited cooking, protection or segregation of food preparation facilities shall not be required if approved by the building official.

436.6.3 Where automatic extinguishing is used to meet the requirements of this section, sprinkler piping serving not more than six sprinklers for any isolated hazardous area shall be permitted to be connected directly to a domestic water supply system having a capacity sufficient to provide 0.15 gpm/per square foot (6.1 L/min/m²) of floor area throughout the entire enclosed area. An indicating shutoff valve shall be installed in an accessible location between the sprinklers and the connection to the domestic water supply.

436.7 Detection and alarm systems. Day care occupancies shall be provided with a fire alarm system in accordance with Section 907 and this section.

Exception: Day care occupancies housed in one room.

436.7.1 Initiation of the required fire alarm system shall be by manual means and by operation of any required smoke detectors and required sprinkler systems.

436.7.1.1 Occupant notification signals shall be audible and visual signals in accordance with NFPA 72 and Chapter 11 of this code. The general evacuation alarm signal shall operate throughout the entire building.

Exceptions:

1. Where total evacuation of occupants is impractical because of building configuration, only the occupants in the affected zones shall be initially notified. Provisions shall be made to selectively notify occupants in other zones to afford orderly evacuation of the entire building.
2. Where occupants are incapable of evacuating themselves because of age, physical or mental disability or physical restraint, the private operating mode as described in NFPA 72 shall be permitted to be used. Only the attendants and other personnel required to evacuate occupants from a zone, area, floor, or building shall be required to be notified. This notification shall

include means to readily identify the zone, area, floor or building in need of evacuation.

436.7.1.2 Fire department notification. The fire alarm system shall be arranged to transmit the alarm automatically to the fire department in accordance with NFPA 72 by means of one of the following methods as approved by the building official:

1. An auxiliary alarm system, or
2. A central station connection, or
3. A proprietary system, or
4. A remote station connection.

Exception: Where none of the above means of notification is available, a plan for notification of the fire department, acceptable to the building official, shall be provided.

436.7.2 Detection. A smoke detection system shall be installed in accordance with NFPA 72, with placement of detectors in each story in front of doors to the stairways and in the corridors of all floors occupied by the day care occupancy. Detectors also shall be installed in lounges, recreation areas and sleeping rooms in the day care occupancy.

Exception: Day care occupancies housed in one room.

436.8 Corridors. Every interior corridor shall be constructed of walls having not less than a 1-hour fire-resistance rating.

Exceptions:

1. In buildings protected throughout by an approved, supervised automatic sprinkler system in accordance with Sections 901.6 and 903.3.1.1 corridor walls shall not be required to be rated, provided that such walls form smoke partitions in accordance with Section 710.
2. Where the corridor ceiling is an assembly having an 1-hour fire-resistance rating where tested as a wall, the corridor walls shall be permitted to terminate at the corridor ceiling.
3. Lavatories in unsprinklered buildings shall not be required to be separated from corridors, provided that they are separated from all other spaces by walls having not less than a 1-hour fire-resistance rating in accordance with Section 709.
4. Lavatories shall not be required to be separated from corridors, provided the building is protected throughout by an approved, supervised automatic sprinkler system in accordance with Sections 901.6 and 903.3.1.1.

436.9 Flexible plan and open plan buildings. Flexible plan and open plan buildings shall comply with the requirements of this chapter as modified as follows:

436.9.1 Each room occupied by more than 300 persons shall have two or more means of egress entering into separate atmospheres. Where three or more means of egress are required, not more than two of them shall enter into a common atmosphere.

436.9.2 Flexible plan buildings shall be evaluated while all folding walls are extended and in use as well as when they are in the retracted position.

436.10 Day care homes.

436.10.1 This section establishes life safety requirements for day care homes in which more than three but not more than 12 clients receive care, maintenance and supervision by other than their relative(s) or legal guardian(s) for less than 24 hours per day.

Exception: Facilities that supervise clients on a temporary basis with a parent or guardian in close proximity.

436.10.2 Definitions. For definitions, see Chapter 2.

436.10.3 Places of religious worship shall not be required to meet the provisions of this section in order to operate a nursery while services are being held in the building.

436.10.4 Occupancies that include part-day preschools, kindergartens and other schools whose purpose is primarily educational even though the children are of preschool age shall comply with the provisions for Group E occupancy.

436.10.5 Smoke detection systems.

436.10.5.1 Single-station smoke alarms installed in accordance with the household fire warning equipment requirements of Chapter 2 of NFPA 72 shall be installed within day care homes.

Exception: System smoke detectors installed in accordance with NFPA 72 and arranged to function in the same manner shall be permitted.

436.10.5.2 Where the day care home is located within a building of another occupancy, any corridors serving the day care home shall be provided with a complete smoke detection system installed in accordance with NFPA 72.

436.10.5.3 Single-station smoke alarms shall be powered by the building electrical system.

436.10.5.4 Single-station smoke alarms shall be provided in all rooms used for sleeping.

436.10.5.5 Where two or more smoke alarms are required within a living unit, suite of rooms, or similar area, they shall be arranged so that operation of any smoke alarm shall cause all smoke alarms within the living unit, suite of rooms or similar area to sound.

436.10.5.5.1 The alarms shall sound only within an individual living unit, suite of rooms or similar area and shall not actuate the building fire alarm system. Remote annunciation shall be permitted.

**SECTION 437
HOSPICE INPATIENT FACILITIES AND
UNITS AND HOSPICE RESIDENCES**

437.1 Scope. All hospice inpatient facilities and units and residences shall comply with the following design and construction standards. Enforcement and interpretation of these provisions shall be by the state agency authorized by Section 553.73, *Florida Statutes*.

Note: Other administrative and programmatic provisions may apply. See Department of Elder Affairs (DOEA) Rule 58A-2, *Florida Administrative Code*, Agency for Health Care Administration (AHCA) Rule 59C-1, *Florida Administrative Code*, and *Chapter 400 Part VI, Florida Statutes*.

437.2 Physical plant requirements (inpatient facility and unit).

437.2.1 As used in this rule, “inpatient facility and unit” means the location where inpatient services are provided to hospice patients that are in need of hospice inpatient care.

437.2.2 Codes and standards.

437.2.2.1 All new inpatient units and facilities, and additions or renovations to existing units and facilities shall be in compliance with the requirements for:

1. Institutional Occupancy – Group I-2, as described in Section 308.3 of this code; and
2. The National Fire Protection Association Life Safety Code 101, Chapter 18, New Health Care Occupancy, as described in Rule 69A-3.012, F.A.C., Standards of the National Fire Protection Association and incorporated by reference in Rule 69A-3.012, F.A.C.

437.2.2.2 All new inpatient sleeping rooms shall be made accessible and shall comply with the requirements of the *Florida Building Code*, Section 11-6.1(1).

437.2.2.3 In renovations and additions to existing facilities, only that portion of the total facility affected by the project must comply with applicable sections of the codes for new facilities and units.

437.2.2.4 Existing portions of the facility that are not included in the renovation or addition but are essential to the functioning of the complete facility, as well as existing areas which receive less than substantial amounts of new work, shall comply with the applicable sections of the codes for existing inpatient facilities and units.

437.2.2.5 All existing inpatient facilities and units licensed by the Agency for Health Care Administration shall be in compliance with National Fire Protection Association Life Safety Code 101, Chapter 19, Existing Health Care Occupancy, and incorporated by reference in Rule 69A-3.012, F.A.C.

437.2.3 Construction requirements. The following shall be provided in each inpatient facility and unit:

437.2.3.1 Each patient sleeping room shall have a minimum room area exclusive of toilet room, or permanently attached or built in closets, lockers or wardrobes, of 100 square feet (9.29 m²) per bed for private rooms and 80 square feet (7.70 m²) per bed for double occupancy rooms.

437.2.3.2 Each patient sleeping room shall have a window or door with a clear glass light in compliance with Section 1205.2 of the *Florida Building Code*. The window or door shall open directly to an atrium or to the outside of the building with a minimum of 20 feet (6.10 m)

in clear and unobstructed vista measured perpendicularly from the window or door.

437.2.3.3 Each patient sleeping room shall have a wardrobe, locker or closet suitable for hanging clothing of the patient.

437.2.3.4 Other than a patient sleeping room located in a hospital or nursing home, each patient sleeping room shall have access to a toilet room without having to enter the general corridor area. One toilet room shall serve no more than four beds and no more than two resident rooms. The door shall be side hinged, swing out from the toilet room, and unless otherwise required by this code, be at least 32 inches (813 mm) wide. The toilet room shall contain a water closet with grab bars on both sides and an emergency nurse call station. The water closet shall be equipped with a bedpan-rinsing device.

437.2.3.5 A hand washing facility shall be provided within each patient toilet room or within each patient bedroom.

437.2.3.6 A nurses’ station, clean workroom and soiled workroom shall be provided. Access to these rooms shall be from a corridor or ante room.

437.2.3.7 A charting space for clinical staff shall be provided at each nurses’ station.

437.2.3.8 A hand washing facility shall be located in or near each nurses’ station.

437.2.3.9 The clean workroom shall be provided with a work counter, hand wash facility, storage facilities and covered waste receptacle.

437.2.3.10 The soiled workroom shall be provided with a service sink equipped with rinsing device, work counter, a hand-washing facility, storage facilities, covered waste receptacle and covered linen receptacle.

437.2.3.11 A drug distribution system shall be provided with provisions for the locked storage of medications. Nothing in this section shall prohibit the use of the clean workroom for drug distribution.

437.2.3.12 A clean linen storage room or closet shall be provided.

437.2.3.13 A nourishment station with equipment for preparing or serving nourishments between scheduled meals shall be provided and shall be available for patient, family, volunteers, guests and staff use. Provisions shall be made for the use and storage of small appliances such as coffee makers or toasters. A minimum of two duplex receptacles connected to a small appliance circuit shall be provided.

437.2.3.14 A nurse calling system accessible by the patient shall be provided.

437.2.3.15 Storage for administrative supplies shall be provided.

437.2.3.16 Parking for stretchers and wheelchairs in an area out of the path of normal traffic and of adequate size for the unit shall be provided.

437.2.3.17 A janitor's closet with a floor drain and storage space for housekeeping equipment and supplies shall be provided.

437.2.3.18 A multipurpose lounge suitable and furnished for reception, recreation, dining, visitation, group social activities and worship shall be provided.

437.2.3.19 A conference or consultation room for patient and family use shall be provided.

437.2.3.20 A washer and dryer for patients' personal use shall be provided.

437.2.4 Details.

437.2.4.1 Fixtures, such as drinking fountains, public telephone, vending machines and portable equipment, shall not be located or stored so as to restrict corridor traffic or reduce the minimum required corridor width.

437.2.4.2 Doors to patient tub rooms, showers and water closets that swing into the room shall be equipped with reversible hardware that will allow the door to swing out in an emergency.

437.2.4.3 Doors, except those to closets or spaces not subject to occupancy, shall not swing into the exit access corridors.

437.2.4.4 Windows and outer doors, if used for ventilation, shall be equipped with insect screens.

437.2.4.5 Interior thresholds and expansion joint covers shall be made flush with the floor surface.

437.2.4.6 Grab bars shall be provided at all patient toilets, showers, and tubs. The bars shall have a clearance of 1½ inches (38 mm) to the walls and shall be sufficiently anchored to sustain a concentrated applied load of not less than 250 pounds (113 kg).

437.2.4.7 Single paper towel dispensers, soap dispensers and covered waste receptacles shall be provided at all hand washing facilities.

437.2.4.8 Staff hand washing facilities shall be fitted with wrist blades and a gooseneck type spout.

437.2.4.9 All hand washing facilities shall be securely anchored to withstand an applied vertical load of not less than two hundred and fifty pounds on the front of the fixture.

437.2.5 Elevators. In new multistory units and facilities an elevator shall be provided in compliance with the requirements of Chapter 30 of the *Florida Building Code, Building*. In addition, a hospital-type elevator large enough to accommodate a bed and attending staff shall service all patient sleeping rooms and patient treatment areas located above the ground floor. The car shall be at least 5 feet 8 inches (1.73 m) wide by 9 feet (2.74 m) deep and the car doors shall have a clear opening of not less than 4 feet (1.22 m) wide and 7 feet (2.13 m) high.

437.2.6 Mechanical system requirements.

437.2.6.1 Air conditioning, heating and ventilating systems.

1. All patient occupied areas shall be heated or cooled by individual or central units. Heating units shall be designed to provide a minimum of 72°F (22.22°C) ambient indoor temperature and air conditioning units shall be designed to provide a minimum of 78°F (25.55°C) ambient indoor temperature.

2. All air-supply and air-exhaust systems shall be mechanically operated. Fans serving exhaust systems shall be located at the discharge end of the system.

437.2.6.2 Plumbing and other piping systems. Water distribution systems shall be arranged to provide hot water at each hot water outlet at all times. Hot water at shower, bathing, and hand washing facilities for patients' personal use shall not exceed 110°F (43.3°C).

437.2.7 Electrical system requirements.

437.2.7.1 Lighting.

1. All spaces occupied by people, machinery, and equipment within the building, approaches to building, and parking areas shall have electric lighting.

2. All patients' rooms shall have general lighting and night lighting. General room luminaries shall be switched at the entrance to the patient room.

437.2.7.2 Receptacles. All patient rooms shall have hospital grade duplex grounding type receptacles.

437.2.8 Emergency electrical system.

437.2.8.1 A Type 1 essential electrical system shall be provided in all hospice facilities as described in National Fire Protection Association Life Safety Code 99, "Health Care Facilities", and incorporated by reference in Rule 69A-3.012, *F.A.C.* The emergency power for this system shall meet the requirements of a Level 1, type 10, Class 48 generator as described in National Fire Protection Association Life Safety Code 110, "Emergency Standby Power Systems", and incorporated by reference in Rule 69A-3.012, *F.A.C.*

437.2.8.2 In new construction, the normal main service equipment shall be separated from the emergency distribution equipment by locating it in a separate room. Transfer switches shall be considered emergency distribution equipment for this purpose.

437.2.8.3 Switches for critical branch lighting shall be completely separate from normal switching. The devices or cover plates shall be of a distinctive color. Critical branch switches are permitted to be adjacent to normal switches. Switches for life safety lighting are not permitted except as required for dusk-to-dawn automatic control of exterior lighting fixtures.

437.2.8.4 There shall be selected life safety lighting provided at a minimum of 1 footcandle and designed for automatic dusk-to-dawn operation along the travel paths from the exits to the public way or to safe areas located a minimum of 30 feet (9.14 m) from the building.

437.2.8.5 A minimum of one elevator per bank serving any patient use floor shall be connected to the equipment branch of the essential electric system and arranged for manual or automatic operation during loss of normal power. Elevator cab lighting, controls, and communication and signal systems shall be connected to the life safety branch.

437.2.8.6 There shall be a dedicated low-fuel alarm for the day tank supplying the emergency generator driver. A manual pump shall also be provided for the day tank. The alarm shall be located at the generator derangement panel.

437.2.8.7 Transfer switch contacts shall be of the open type and shall be accessible for inspection and replacement.

437.2.8.8 If required by the facility's emergency food plan, there shall be power connected to the equipment branch of the essential electrical system for kitchen refrigerators, freezers and range hood exhaust fans. Selected lighting within the kitchen and dry storage areas shall be connected to the critical branch of the essential electrical system.

437.3 Residential units.

437.3.1 Residential units shall comply with the *Florida Building Code* and the National Fire Protection Association Life Safety Code 101 as adopted by the *Florida Fire Prevention Code*.

437.3.2 Residential units shall comply with the following codes and standards:

437.3.2.1 All new facilities and additions and renovations to existing facilities shall be in compliance with:

1. Section 310.1 of this code for Group R-4 occupancy;
2. The National Fire Protection Association Life Safety Code 101, Chapter 32, Residential Board and Care Occupancy and incorporated by reference in Rule 69A-3.012, *F.A.C.*, and
3. Chapter 11, Section 11-6.1(1) of the *Florida Building Code, Building*.

437.3.2.2 All existing facilities shall comply with National Fire Protection Association Life Safety Code 101, Chapter 33, Residential Board and Care Occupancy and incorporated by reference in Rule 69A-3.012, *F.A.C.*

SECTION 438 GROUP I-1, R-1, R-2, R-3

438.1 General. Occupancies in Groups I-1, R-1, R-2 and R-3 shall comply with the provisions of this section and other applicable provisions of this code.

438.2 Separation walls. Walls separating dwelling units in the same building and walls separating sleeping units in the same building shall comply with Section 708.

438.3 Horizontal separation. Floor/ceiling assemblies separating dwelling units in the same buildings and floor/ceiling

assemblies separating sleeping units in the same building shall be constructed in accordance with Section 711.

SECTION 439 HYDROGEN CUTOFF ROOMS

[F] 439.1 General. When required by the *Florida Fire Prevention Code*, hydrogen cutoff rooms shall be designed and constructed in accordance with this section.

[F] 439.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

[F] GASEOUS HYDROGEN SYSTEM. An assembly of piping, devices and apparatus designed to generate, store, contain, distribute or transport a nontoxic, gaseous hydrogen-containing mixture having at least 95-percent hydrogen gas by volume and not more than 1-percent oxygen by volume. Gaseous hydrogen systems consist of items such as compressed gas containers, reactors and appurtenances, including pressure regulators, pressure relief devices, manifolds, pumps, compressors and interconnecting piping and tubing and controls.

[F] HYDROGEN CUTOFF ROOM. A room or space that is intended exclusively to house a gaseous hydrogen system.

[F] 439.3 Location. Hydrogen cut-off rooms shall not be located below grade.

[F] 439.4 Design and construction. Hydrogen cutoff rooms shall be classified with respect to occupancy in accordance with Section 302.1 and separated from other areas of the building by not less than 1-hour fire barriers or as required by Section 508.2 or 508.3 as applicable.

[F] 439.4.1 Opening protectives. Doors within such fire barrier walls, including doors to corridors, shall be self-closing in accordance with Section 715. Interior door openings shall be electronically interlocked to prevent operation of the hydrogen system when doors are opened or ajar or the room shall be provided with a mechanical exhaust ventilation system designed in accordance with Section 439.4.1.1.

[F] 439.4.1.1 Ventilation alternative. When an exhaust system is used in lieu of the interlock system required by Section 439.4, exhaust ventilation systems shall operate continuously and shall be designed to operate at a negative pressure in relation to the surrounding area. The average velocity of ventilation at the face of the door opening with the door in the fully open position shall not be less than 60 feet per minute (0.3048 m/s) with a minimum of 45 feet per minute (0.2287 m/s) at any point in the door opening.

[F] 439.4.2 Windows. Operable windows in interior walls shall not be permitted. Fixed windows shall be permitted when in accordance with Section 715.

[F] 439.5 Ventilation. Cutoff rooms shall be provided with mechanical ventilation in accordance with the applicable provisions for repair garages in Chapter 5 of the *Florida Building Code, Mechanical*.

|| [F] **439.6 Gas detection system.** Hydrogen cutoff rooms shall be provided with an approved flammable gas-detection system in accordance with Sections 439.6.1 through 439.6.3.

|| [F] **439.6.1 System design.** The flammable gas-detection system shall be listed for use with hydrogen and any other flammable gases used in the room. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammability limit (LFL) for the gas or mixtures present at their anticipated temperature and pressure.

|| [F] **439.6.2 Operation.** Activation of the gas detection system shall result in all of the following:

1. Initiation of distinct audible and visual alarm signals both inside and outside of the cutoff room.
2. Activation of the mechanical ventilation system.

|| [F] **439.6.3 Failure of the gas detection system.** Failure of the gas detection system shall result in activation of the mechanical ventilation system, cessation of hydrogen generation and the sounding of a trouble signal in an approved location.

|| [F] **439.7 Explosion control.** Explosion control shall be provided in accordance with the *Florida Fire Prevention Code*.

|| [F] **439.8 Standby power.** Mechanical ventilation and gas detection systems shall be connected to a standby power system in accordance with Chapter 27.

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CHAPTER 5

GENERAL BUILDING HEIGHTS AND AREAS

SECTION 501 GENERAL

501.1 Scope. The provisions of this chapter control the height and area of structures hereafter erected and additions to existing structures.

[F] 501.2 Address numbers. Buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numerals or alphabetical letters. Numbers shall be a minimum of 4 inches (102 mm) high with a minimum stroke width of 0.5 inch (12.7 mm).

SECTION 502 DEFINITIONS

502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AREA, BUILDING. The area included within surrounding exterior walls (or exterior walls and fire walls) exclusive of vent shafts and courts. Areas of the building not provided with surrounding walls shall be included in the building area if such areas are included within the horizontal projection of the roof or floor above.

BASEMENT. That portion of a building that is partly or completely below grade plane (see “Story above grade plane” in Section 202). 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.

EQUIPMENT PLATFORM. An unoccupied, elevated platform used exclusively for mechanical systems or industrial process equipment, including the associated elevated walkways, stairs and ladders necessary to access the platform (see Section 505.5).

GRADE PLANE. A reference plane representing the average of finished ground level adjoining the building at exterior walls. Where the finished ground level slopes away from the exterior walls, the reference plane shall be established by the lowest points within the area between the building and the lot line or, where the lot line is more than 6 feet (1829 mm) from the building, between the building and a point 6 feet (1829 mm) from the building.

HEIGHT, BUILDING. The vertical distance from grade plane to the average height of the highest roof surface.

HEIGHT, STORY. The vertical distance from top to top of two successive 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.

MEZZANINE. An intermediate level or levels between the floor and ceiling of any story and in accordance with Section 505.

SECTION 503 GENERAL HEIGHT AND AREA LIMITATIONS

503.1 General. The height and area for buildings of different construction types shall be governed by the intended use of the building and shall not exceed the limits in Table 503 except as modified hereafter. Each part of a building included within the exterior walls or the exterior walls and fire walls where provided shall be permitted to be a separate building.

503.1.1 Special industrial occupancies. Buildings and structures designed to house special industrial processes that require large areas and unusual heights to accommodate craneways or special machinery and equipment, including, among others, rolling mills; structural metal fabrication shops and foundries; or the production and distribution of electric, gas or steam power, shall be exempt from the height and area limitations of Table 503.

503.1.2 Buildings on same lot. Two or more buildings on the same lot shall be regulated as separate buildings or shall be considered as portions of one building if the height of each building and the aggregate area of buildings are within the limitations of Table 503 as modified by Sections 504 and 506. The provisions of this code applicable to the aggregate building shall be applicable to each building.

503.1.3 Type I construction. Buildings of Type I construction permitted to be of unlimited tabular heights and areas are not subject to the special requirements that allow unlimited area buildings in Section 507 or unlimited height in Sections 503.1.1 and 504.3 or increased height and areas for other types of construction.

503.1.4 Basements. A basement of a building shall not count as a story when applying Table 503 for allowable building height.

503.1.5 Group A and E basements. Group A and E basements used as classrooms or assembly rooms shall be counted as a story.

SECTION 504 HEIGHT

504.1 Special unlimited height. The height of Group B, M and R occupancies of Type I-B construction shall not be limited, provided the fire resistance of all columns shall be not less

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS^a
 Height limitations shown as stories and feet above grade plane.
 Area limitations as determined by the definition of "Area, building," per story

GROUP	HGT(feet) HGT(S)	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
		UL	160	65	55	65	55	65	50	40
A-1	S A	UL UL	5 UL	3 15,500	2 8,500	3 14,000	2 8,500	3 15,000	2 11,500	1 5,500
A-2	S A	UL UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000
A-3	S A	UL UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000
A-4	S A	UL UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000
A-5	S A	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL
B	S A	UL UL	11 UL	5 37,500	4 23,000	5 28,500	4 19,000	5 36,000	3 18,000	2 9,000
E/D	S A	UL UL	5 UL	3 26,500	2 14,500	3 23,500	2 14,500	3 25,500	1 18,500	1 9,500
F-1	S A	UL UL	11 UL	4 25,000	2 15,500	3 19,000	2 12,000	4 33,500	2 14,000	1 8,500
F-2/F-3	S A	UL UL	11 UL	5 37,500	3 23,000	4 28,500	3 18,000	5 50,500	3 21,000	2 13,000
H-1	S A	1 21,000	1 16,500	1 11,000	1 7,000	1 9,500	1 7,000	1 10,500	1 7,500	NP NP
H-2 ^d	S A	UL 21,000	3 16,500	2 11,000	1 7,000	2 9,500	1 7,000	2 10,500	1 7,500	1 3,000
H-3 ^d	S A	UL UL	6 60,000	4 26,500	2 14,000	4 17,500	2 13,000	4 25,500	2 10,000	1 5,000
H-4	S A	UL UL	7 UL	5 37,500	3 17,500	5 28,500	3 17,500	5 36,000	3 18,000	2 6,500
H-5	S A	4 UL	4 UL	3 37,500	3 23,000	3 28,500	3 19,000	3 36,000	3 18,000	2 9,000
I-1	S A	UL UL	9 55,000	4 19,000	3 10,000	4 16,500	3 10,000	4 18,000	3 10,500	2 4,500
I-2	S A	UL UL	4 UL	2 15,000	1 11,000	1 12,000	NP NP	1 12,000	1 9,500	NP NP
I-3	S A	UL UL	4 UL	2 15,000	1 10,000	2 10,500	1 7,500	2 12,000	2 7,500	1 5,000
M	S A	UL UL	11 UL	4 21,500	4 12,500	4 18,500	4 12,500	4 20,500	3 14,000	1 9,000
R-1	S A	UL UL	11 UL	4 24,000	4 16,000	4 24,000	4 16,000	4 20,500	3 12,000	2 7,000
R-2	S A	UL UL	11 UL	4 24,000	4 16,000	4 24,000	4 16,000	4 20,500	3 12,000	2 7,000
R-3	S A	UL UL	11 UL	4 UL	4 UL	4 UL	4 UL	4 UL	3 UL	3 UL
R-4	S A	UL UL	11 UL	4 24,000	4 16,000	4 24,000	4 16,000	4 20,500	3 12,000	2 7,000
S-1	S A	UL UL	11 48,000	4 26,000	3 17,500	3 26,000	3 17,500	4 25,500	3 14,000	1 9,000
S-2 ^{b,c}	S A	UL UL	11 79,000	5 39,000	4 26,000	4 39,000	4 26,000	5 38,500	4 21,000	2 13,500
U ^c	S A	UL UL	5 35,500	4 19,000	2 8,500	3 14,000	2 8,500	4 18,000	2 9,000	1 5,500

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

UL = Unlimited, NP = Not permitted.

a. See the following sections for general exceptions to Table 503:

1. Section 504.2, Allowable height increase due to automatic sprinkler system installation.
2. Section 506.2, Allowable area increase due to street frontage.
3. Section 506.3, Allowable area increase due to automatic sprinkler system installation.
4. Section 507, Unlimited area buildings.

b. For open parking structures, see Section 406.3.

c. For private garages, see Section 406.1.

d. See Section 415.5 for limitations.

than 3 hours and the other structural members including floors shall be not less than that shown in Chapter 6, but in no case less than 2 hours except that roofs and their supporting beams, girders, trusses and arches shall be not less than 1½ hours.

Exception: The height of one-story aircraft hangars, aircraft paint hangars and buildings used for the manufacturing of aircraft shall not be limited if the building is provided with an automatic fire-extinguishing system in accordance with Chapter 9 and is entirely surrounded by public ways or yards not less in width than one and one-half times the height of the building.

504.2 Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one. These increases are permitted in addition to the area increase in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one, but shall not exceed 60 feet (18 288 mm) or four stories, respectively.

Exceptions:

1. Fire areas with an occupancy in Group I-2 of Type IIB, III, IV or V construction.
2. Fire areas with an occupancy in Group H-1, H-2, H-3 or H-5.
3. Fire-resistance rating substitution in accordance with Table 601, Note h.

504.3 Roof structures. Towers, spires, steeples and other roof structures shall be constructed of materials consistent with the required type of construction of the building except where other construction is permitted by Section 1509.2.1. Such structures shall not be used for habitation or storage. The structures shall be unlimited in height if of noncombustible materials and shall not extend more than 20 feet (6096 mm) above the allowable height if of combustible materials (see Chapter 15 for additional requirements).

SECTION 505 MEZZANINES

505.1 General. A mezzanine or mezzanines in compliance with Section 505 shall be considered a portion of the story below. Such mezzanines shall not contribute to either the building area or number of stories as regulated by Section 503.1. The area of the mezzanine shall be included in determining the fire area defined in Section 702. The clear height above and below the mezzanine floor construction shall not be less than 7 feet (2134 mm).

505.2 Area limitation. The aggregate area of a mezzanine or mezzanines within a room shall not exceed one-third of the floor area of that room or space in which they are located. The enclosed portion of a room shall not be included in a determination of the floor area of the room in which the mezzanine is

located. In determining the allowable mezzanine area, the area of the mezzanine shall not be included in the floor area of the room.

Exceptions:

1. The aggregate area of mezzanines in buildings and structures of Type I or II construction for special industrial occupancies in accordance with Section 306.4 shall not exceed two-thirds of the floor area of the room.
2. The aggregate area of mezzanines in buildings and structures of Type I or II construction shall not exceed one-half of the floor area of the room in buildings and structures equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 and an approved emergency voice/alarm communication system in accordance with Section 907.2.12.2.
3. In sprinklered Group S2 occupancies of Type III construction, the enclosed and unenclosed areas under mezzanines shall be allowed to be included when calculating the permissible size of mezzanines.

505.3 Egress. Each occupant of a mezzanine shall have access to at least two independent means of egress where the common path of egress travel exceeds the limitations of Section 1014.3. Where a stairway provides a means of exit access from a mezzanine, the maximum travel distance includes the distance traveled on the stairway measured in the plane of the tread nosing. Accessible means of egress shall be provided in accordance with Section 1007.

Exception: A single means of egress shall be permitted in accordance with Section 1015.1.

505.4 Openness. A mezzanine shall be open and unobstructed to the room in which such mezzanine is located except for walls not more than 42 inches (1067 mm) high, columns and posts.

Exceptions:

1. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the occupant load of the aggregate area of the enclosed space does not exceed 10.
2. A mezzanine having two or more means of egress is not required to be open to the room in which the mezzanine is located if at least one of the means of egress provides direct access to an exit from the mezzanine level.
3. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the aggregate floor area of the enclosed space does not exceed 10 percent of the mezzanine area.
4. In industrial facilities, mezzanines used for control equipment are permitted to be glazed on all sides.
5. In other than Groups H and I occupancies no more than two stories in height above grade plane and equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, a mezza-

nine having two or more means of egress shall not be required to be open to the room in which the mezzanine is located.

505.5 Equipment platforms. Equipment platforms in buildings shall not be considered as a portion of the floor below. Such equipment platforms shall not contribute to either the building area or the number of stories as regulated by Section 503.1. The area of the equipment platform shall not be included in determining the fire area. Equipment platforms shall not be a part of any mezzanine and such platforms and the walkways, stairs and ladders providing access to an equipment platform shall not serve as a part of the means of egress from the building.

505.5.1 Area limitations. The aggregate area of all equipment platforms within a room shall not exceed two-thirds of the area of the room in which they are located. Where an equipment platform is located in the same room as a mezzanine, the area of the mezzanine shall be determined by Section 505.2 and the combined aggregate area of the equipment platforms and mezzanines shall not exceed two-thirds of the room in which they are located.

[F] 505.5.2 Fire suppression. Where located in a building that is required to be protected by an automatic sprinkler system, equipment platforms shall be fully protected by sprinklers above and below the platform, where required by the standards referenced in Section 903.3.

505.5.3 Guards. Equipment platforms shall have guards where required by Section 1013.1.

**SECTION 506
AREA MODIFICATIONS**

506.1 General. The areas limited by Table 503 shall be permitted to be increased due to frontage (I_f) and automatic sprinkler system protection (I_s) in accordance with the following:

$$A_a = \{ A_t + [A_t \times I_f] + [A_t \times I_s] \} \quad \text{(Equation 5-1)}$$

where:

- A_a = Allowable area per story (square feet).
- A_t = Tabular area per story in accordance with Table 503 (square feet).
- I_f = Area increase factor due to frontage as calculated in accordance with Section 506.2.
- I_s = Area increase factor due to sprinkler protection as calculated in accordance with Section 506.3.

506.1.1 Basements. A single basement that is not a story above grade plane need not be included in the total allowable area, provided such basement does not exceed the area permitted for a building with no more than one story above grade plane.

506.2 Frontage increase. Every building shall adjoin or have access to a public way to receive an area increase for frontage. Where a building has more than 25 percent of its perimeter on a public way or open space having a minimum width of 20 feet (6096 mm), the frontage increase shall be determined in accordance with the following:

$$I_f = [F / P - 0.25] W / 30 \quad \text{(Equation 5-2)}$$

where:

- I_f = Area increase due to frontage.
- F = Building perimeter that fronts on a public way or open space having 20 feet (6096 mm) open minimum width (feet).
- P = Perimeter of entire building (feet).
- W = Width of public way or open space (feet) in accordance with Section 506.2.1.

506.2.1 Width limits. “ W ” must be at least 20 feet (6096 mm). Where the value of W varies along the perimeter of the building, the calculation performed in accordance with Equation 5-2 shall be based on the weighted average of each portion of exterior wall and open space where the value of W is greater than or equal to 20 feet (6096 mm). Where W exceeds 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the weighted average, regardless of the actual width of the open space.

Exception: The quantity of W divided by 30 shall be permitted to be a maximum of 2 when the building meets all requirements of Section 507 except for compliance with the 60-foot (18 288 mm) public way or yard requirement, as applicable.

506.2.2 Open space limits. Such open space shall be either on the same lot or dedicated for public use and shall be accessed from a street or approved fire lane.

506.3 Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the area limitation in Table 503 is permitted to be increased by an additional 200 percent ($I_s = 2$) for buildings with more than one story above grade plane and an additional 300 percent ($I_s = 3$) for buildings with no more than one story above grade plane. These increases are permitted in addition to the height and story increases in accordance with Section 504.2.

Exception: The area limitation increases shall not be permitted for the following conditions:

1. The automatic sprinkler system increase shall not apply to buildings with an occupancy in Use Group H-1.
2. The automatic sprinkler system increase shall not apply to the floor area of an occupancy in Use Group H-2 or H-3. For mixed-use buildings containing such occupancies, the allowable area shall be calculated in accordance with Section 508.3.3.2, with the sprinkler increase applicable only to the portions of the building not classified as Use Group H-2 or H-3.
3. Fire-resistance rating substitution in accordance with Table 601, Note h.

506.4 Area determination. The maximum area of a building with more than one story above grade plane shall be determined by multiplying the allowable area of the first story (A_a), as determined in Section 506.1, by the number of stories above grade plane as listed below:

1. For buildings with two stories above grade plane, multiply by 2;
2. For buildings with three or more stories above grade plane, multiply by 3; and
3. No story shall exceed the allowable area per story (A_a), as determined in Section 506.1, for the occupancies on that story.

Exceptions:

1. Unlimited area buildings in accordance with Section 507.
2. The maximum area of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2 shall be determined by multiplying the allowable area per story (A_a), as determined in Section 506.1, by the number of stories above grade plane.

506.4.1 Mixed occupancies. In buildings with mixed occupancies, the allowable area per story (A_a) shall be based on the most restrictive provisions for each occupancy when the mixed occupancies are treated according to Section 508.3.2. When the occupancies are treated according to Section 508.3.3 as separated occupancies, the maximum total building area shall be such that the sum of the ratios for each such area on all floors as calculated according to Section 508.3.3.2 shall not exceed 2 for two-story buildings and 3 for buildings three stories or higher.

SECTION 507 UNLIMITED AREA BUILDINGS

507.1 General. The area of buildings of the occupancies and configurations specified herein shall not be limited.

507.2 Nonsprinklered, one story. Reserved.

507.3 Sprinklered, one story. The area of a one-story, Group B, F, M or S building or a one-story Group A-4 building, of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

1. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.2 and 903.3.1.1 and NFPA 230.
2. The automatic sprinkler system shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:
 - 2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and

- 2.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.
3. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted, provided:
 - 3.1. All assembly occupancies are separated from other spaces as required for separated uses in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;
 - 3.2. Each Group A occupancy shall not exceed the maximum allowable area permitted in Section 503.1; and
 - 3.3. All required exits shall discharge directly to the exterior.

507.4 Two story. Reserved.

507.5 Reduced open space. The permanent open space of 60 feet (18 288 mm) required in Sections 507.3, 507.6 and 507.10 shall be permitted to be reduced to not less than 40 feet (12 192 mm), provided the following requirements are met:

1. The reduced open space shall not be allowed for more than 75 percent of the perimeter of the building.
2. The exterior wall facing the reduced open space shall have a minimum fire-resistance rating of 3 hours.
3. Openings in the exterior wall facing the reduced open space shall have opening protectives with a minimum fire protection rating of 3 hours.

507.6 Group A-3 buildings. The area of a one-story, Group A-3 building used as a place of religious worship, community hall, dance hall, exhibition hall, gymnasium, lecture hall, indoor swimming pool or tennis court of Type II construction shall not be limited when all of the following criteria are met:

1. The building shall not have a stage other than a platform.
2. The building shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. The assembly floor shall be located at or within 21 inches (533 mm) of street or grade level and all exits are provided with ramps complying with Section 1010.1 to the street or grade level.
4. The building shall be surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

507.7 Group H occupancies. Group H-2, H-3 and H-4 occupancies shall be permitted in unlimited area buildings containing Group F and S occupancies, in accordance with Sections 507.3 and 507.4 and the limitations of this section. The aggregate floor area of the Group H occupancies located at the perimeter of the unlimited area building shall not exceed 10 percent of the area of the building nor the area limitations for the Group H occupancies as specified in Table 503 as modified by Section 506.2, based upon the percentage of the perimeter of each Group H fire area that fronts on a street or other unoccupied space. The aggregate floor area of Group H occupancies not located at the perimeter of the building shall not exceed 25

percent of the area limitations for the Group H occupancies as specified in Table 503. Group H fire areas shall be separated from the rest of the unlimited area building and from each other in accordance with Table 508.3.3 For two-story unlimited area buildings, the Group H fire areas shall not be located above the first story unless permitted by the allowable height in stories and feet as set forth in Table 503 based on the type of construction of the unlimited area building.

507.8 Aircraft paint hangar. The area of a one-story, Group H-2 aircraft paint hangar shall not be limited where such aircraft paint hangar complies with the provisions of Section 412.4 and is entirely surrounded by public ways or yards not less in width than one and one-half times the height of the building.

507.9 Group E buildings. The area of a one-story Group E building of Type II, IIIA or IV construction shall not be limited when the following criteria are met:

1. Each classroom shall have not less than two means of egress, with one of the means of egress being a direct exit to the outside of the building complying with Section 1018 or the building is provided with smoke barriers having a minimum 1-hour fire-resistance rating dividing the building into areas not to exceed 30,000 square feet (2787 m²) in floor area.
2. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. The building is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

507.10 One-story Group A buildings without a stage requiring proscenium opening protection of Type II, III-A or IV construction which are surrounded on all sides by a permanent open space of not less than 60 feet (18.3 m), are provided with an approved automatic sprinkler system, and the assembly floor is located at or within 21 inches (533 mm) of street or grade level and all exits meet the street or grade level by ramps having a slope not exceeding a 1:12 shall not be limited in area.

507.11 Covered mall buildings and anchor stores. The area of covered mall buildings and anchor stores not exceeding three stories in height that comply with Section 402.6 shall not be limited.

**SECTION 508
MIXED USE AND OCCUPANCY**

508.1 General. Where a building or portion thereof contains two or more occupancies or uses, the building or portion thereof shall comply with the applicable provisions of this section.

508.2 Incidental uses. Incidental use areas shall comply with the provisions of this section.

Exception: Incidental use areas within and serving a dwelling unit are not required to comply with this section.

508.2.1 Occupancy classification. An incidental use area shall be classified in accordance with the occupancy of that portion of the building in which it is located or the building

shall be classified as a mixed occupancy and shall comply with Section 508.3.

508.2.2 Separation. Incidental use areas shall be separated or protected, or both, in accordance with Table 508.2.

508.2.2.1 Construction. Where Table 508.2 requires a fire-resistance-rated separation, the incidental use area shall be separated from the remainder of the building by a fire barrier constructed in accordance with Section 706 or a horizontal assembly constructed in accordance with Section 711, or both. Where Table 508.2 permits an auto-

**TABLE 508.2
INCIDENTAL USE AREAS**

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic fire-extinguishing system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic fire-extinguishing system
Refrigerant machinery rooms	1 hour or provide automatic sprinkler system
Parking garage (Section 406.2)	2 hours; or 1 hour and provide automatic fire-extinguishing system
Hydrogen cut-off rooms, not classified as Group H	1-hour in Group B, F, M, S and U occupancies. 2-hour in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic fire-extinguishing system
Laboratories and vocational shops, not classified as Group H, located in Group E or I-2 occupancies	1 hour or provide automatic fire-extinguishing system
Laundry rooms over 100 square feet	1 hour or provide automatic fire-extinguishing system
Storage rooms over 100 square feet	1 hour or provide automatic fire-extinguishing system
Group I-3 cells equipped with padded surfaces	1 hour
Group I-2 waste and linen collection rooms	1 hour
Waste and linen collection rooms over 100 square feet	1 hour or provide automatic fire-extinguishing system
Stationary storage battery systems having a liquid capacity of more than 100 gallons used for facility standby power, emergency power or uninterrupted power supplies	1-hour in Group B, F, M, S and U occupancies. 2-hour in Group A, E, I and R occupancies.

For SI: 1 square foot = 0.0929 m², 1 pound per square inch = 6.9 kPa, 1 British thermal unit per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L.

matic fire-extinguishing system without a fire barrier, the incidental use area shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The partitions shall extend from the floor to the underside of the fire-resistance-rated floor/ceiling assembly or fire-resistance-rated roof/ceiling assembly above or to the underside of the floor or roof sheathing, or sub deck above. Doors shall be self- or automatic closing upon detection of smoke in accordance with Section 715.4.7.3. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80.

508.2.3 Protection. Where an automatic fire-extinguishing system or an automatic sprinkler system is provided in accordance with Table 508.2, only the incidental use areas need be equipped with such a system.

508.3 Mixed occupancies. Each portion of a building shall be individually classified in accordance with Section 302.1.

Where a building contains more than one occupancy group, the building or portion thereof shall comply with Sections 508.3.1, 508.3.2, 508.3.3 or a combination of these sections.

Exceptions:

1. Occupancies separated in accordance with Section 509.
2. Where required by Table 415.3.2, areas of Group H-1, H-2 or H-3 occupancies shall be located in a separate and detached building or structure.

508.3.1 Accessory occupancies. Accessory occupancies are those occupancies subsidiary to the main occupancy of the building or portion thereof. Aggregate accessory occupancies shall not occupy more than 10 percent of the area of the story in which they are located and shall not exceed the tabular values in Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies.

Exceptions:

1. Accessory assembly areas having a floor area less than 750 square feet (69.7 m²) are not considered separate occupancies.
2. Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.
3. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

508.3.1.1 Occupancy classification. Accessory occupancies shall be individually classified in accordance with Section 302.1. Code requirements shall apply to each portion of the building based on the occupancy classification of that accessory space, except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the entire building or portion thereof.

508.3.1.2 Allowable area and height. The allowable area and height of the building shall be based on the

allowable area and height for the main occupancy in accordance with Section 503.1. The height of any accessory occupancy shall not exceed the tabular values in Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies.

508.3.1.3 Separation. No separation is required between accessory occupancies or the main occupancy.

Exception: Group H-2, H-3, H-4 or H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.

508.3.2 Nonseparated occupancies. Buildings or portions of buildings that comply with the provisions of this section shall qualify as nonseparated occupancies.

508.3.2.1 Occupancy classification. Nonseparated occupancies shall be individually classified in accordance with Section 302.1. Code requirements shall apply to each portion of the building based on the occupancy classification of that space except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the entire building or portion thereof.

508.3.2.2 Allowable area and height. The allowable area and height of the building or portion thereof shall be based on the most restrictive allowances for the occupancy groups under consideration for the type of construction of the building in accordance with Section 503.1.

508.3.2.3 Separation. No separation is required between occupancies.

Exception: Group H-2, H-3, H-4 or H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.

508.3.3 Separated occupancies. Buildings or portions of buildings that comply with the provisions of this section shall qualify as separated occupancies.

508.3.3.1 Occupancy classification. Separated occupancies shall be individually classified in accordance with Section 302.1. Each fire area shall comply with this code based on the occupancy classification of that portion of the building.

508.3.3.2 Allowable area. In each story, the building area shall be such that the sum of the ratios of the actual floor area of each occupancy divided by the allowable area of each occupancy shall not exceed one.

508.3.3.3 Allowable height. Each occupancy shall comply with the height limitations based on the type of construction of the building in accordance with Section 503.1. The height, in both feet and stories, of each fire area shall be measured from grade plane. This measurement shall include the height, in both feet and stories, of intervening fire areas.

Exception: Special provisions permitted by Section 509.

TABLE 508.3.3
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

OCCUPANCY	A ^e , E, D		I		R ^d		F-2, F-3, S-2 ^{c,d} , U ^d		B ^b , F-1, M ^b , S-1		H-1		H-2		H-3, H-4, H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A ^e , E ^c , D	N	N	1	2	1	2	N	1	1	2	NP	NP	3	4	2	3 ^a
I	—	—	N	N	1	NP	1	2	1	2	NP	NP	3	NP	2	NP
R ^d	—	—	—	—	N	N	1	2	1	2	NP	NP	3	NP	2	NP
F-2, F-3, S-2 ^{c,d} , U ^d	—	—	—	—	—	—	N	N	1	2	NP	NP	3	4	2	3 ^a
B ^b , F-1, M ^b , S-1	—	—	—	—	—	—	—	—	N	N	NP	NP	2	3	1	2 ^a
H-1	—	—	—	—	—	—	—	—	—	—	N	NP	NP	NP	NP	NP
H-2	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	1	NP
H-3, H-4, H-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP

For SI: 1 square foot = 0.0929 m².

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

N = No separation requirement.

NP = Not permitted.

a. For Group H-5 occupancies, see Section 903.2.4.2.

b. Occupancy separation need not be provided for storage areas within Groups B and M if the:

1. Area is less than 10 percent of the floor area;
2. Area is equipped with an automatic fire-extinguishing system and is less than 3,000 square feet; or
3. Area is less than 1,000 square feet.

c. Areas used only for private or pleasure vehicles shall be allowed to reduce separation by 1 hour.

d. See Section 406.1.4.

e. Commercial kitchens need not be separated from the restaurant seating areas that they serve.

508.3.3.4 Separation. Individual occupancies shall be separated from adjacent occupancies in accordance with Table 508.3.3

508.3.3.4.1 Construction. Required separations shall be fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both, so as to completely separate adjacent occupancies.

ing above with a horizontal assembly having a minimum 3-hour fire-resistance rating.

2. Shaft, stairway, ramp or escalator enclosures through the horizontal assembly shall have not less than a 2-hour fire-resistance rating with opening protectives in accordance with Table 715.4.

Exception: Where the enclosure walls below the horizontal assembly have not less than a 3-hour fire-resistance rating with opening protectives in accordance with Table 715.4, the enclosure walls extending above the horizontal assembly shall be permitted to have a 1-hour fire-resistance rating, provided:

1. The building above the horizontal assembly is not required to be of Type I construction;
 2. The enclosure connects less than four stories; and
 3. The enclosure opening protectives above the horizontal assembly have a minimum 1-hour fire protection rating.
3. The building above the horizontal assembly shall be permitted to have multiple Group A uses, each with an occupant load of less than 300, or Group B, M, R or S uses.
 4. The building below the horizontal assembly is a Group S-2 enclosed or open parking garage, used for the parking and storage of private motor vehicles.

**SECTION 509
SPECIAL PROVISIONS**

509.1 General. The provisions in this section shall permit the use of special conditions that are exempt from, or modify, the specific requirements of this chapter regarding the allowable heights and areas of buildings based on the occupancy classification and type of construction, provided the special condition complies with the provisions specified in this section for such condition and other applicable requirements of this code.

509.2 Group S-2 enclosed or open parking garage with Group A, B, M, R or S above. A basement and/or the first story above grade plane of a building shall be considered as a separate and distinct building for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction when all of the following conditions are met:

1. The basement and/or the first story above grade plane is of Type IA construction and is separated from the build-

Exceptions:

1. Entry lobbies, mechanical rooms and similar uses incidental to the operation of the building shall be permitted.
2. Multiple Group A uses, each with an occupant load of less than 300, or Group B or M uses shall be permitted, in addition to those uses incidental to the operation of the building (including storage areas), provided that the entire structure below the horizontal assembly is protected throughout by an approved automatic sprinkler system.
5. The maximum building height in feet shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the grade plane.

509.3 Group S-2 enclosed parking garage with Group S-2 open parking garage above. A Group S-2 enclosed parking garage located in the basement or first story below a Group S-2 open parking garage shall be classified as a separate and distinct building for the purpose of determining the type of construction when the following conditions are met:

1. The allowable area of the structure shall be such that the sum of the ratios of the actual area divided by the allowable area for each separate occupancy shall not exceed 1.0.
2. The Group S-2 enclosed parking garage is of Type I or II construction and is at least equal to the fire-resistance requirements of the Group S-2 open parking garage.
3. The height and the number of the floors above the basement shall be limited as specified in Table 406.3.5.
4. The floor assembly separating the Group S-2 enclosed parking garage and Group S-2 open parking garage shall be protected as required for the floor assembly of the Group S-2 enclosed parking garage. Openings between the Group S-2 enclosed parking garage and Group S-2 open parking garage, except exit openings, shall not be required to be protected.
5. The Group S-2 enclosed parking garage is used exclusively for the parking or storage of private motor vehicles, but shall be permitted to contain an office, waiting room and toilet room having a total area of not more than 1,000 square feet (93 m²), and mechanical equipment rooms incidental to the operation of the building.

509.4 Parking beneath Group R. Where a maximum one-story above grade plane Group S-2 parking garage, enclosed or open, or combination thereof, of Type I construction or open of Type IV construction, with grade entrance, is provided under a building of Group R, the number of stories to be used in determining the minimum type of construction shall be measured from the floor above such a parking area. The number of stories to be used in determining the height in stories in accordance with Section 903.6 shall include the parking garage as a story. The floor assembly between the parking garage and the Group R above shall comply with the type of construction required for the parking garage and shall also pro-

vide a fire-resistance rating not less than the mixed occupancy separation required in Section 302.3.2.

509.5 Group R-2 buildings of Type IIIA construction. The height limitation for buildings of Type IIIA construction in Group R-2 shall be increased to six stories and 75 feet (22 860 mm) where the first-floor construction above the basement has a fire-resistance rating of not less than 3 hours and the floor area is subdivided by 2-hour fire-resistance-rated fire walls into areas of not more than 3,000 square feet (279 m²).

509.6 Group R-2 buildings of Type IIA construction. The height limitation for buildings of Type IIA construction in Group R-2 shall be increased to nine stories and 100 feet (30 480 mm) where the building is separated by not less than 50 feet (15 240 mm) from any other building on the lot and from lot lines, the exits are segregated in an area enclosed by a 2-hour fire-resistance-rated fire wall and the first-floor construction has a fire-resistance rating of not less than 1¹/₂ hours.

509.7 Open parking garage beneath Groups A, I, B, M and R. Open parking garages constructed under Groups A, I, B, M and R shall not exceed the height and area limitations permitted under Section 406.3. The height and area of the portion of the building above the open parking garage shall not exceed the limitations in Section 503 for the upper occupancy. The height, in both feet and stories, of the portion of the building above the open parking garage shall be measured from grade plane and shall include both the open parking garage and the portion of the building above the parking garage.

509.7.1 Fire separation. Fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711 between the parking occupancy and the upper occupancy shall correspond to the required fire-resistance rating prescribed in Table 508.3.3 for the uses involved. The type of construction shall apply to each occupancy individually, except that structural members, including main bracing within the open parking structure, which is necessary to support the upper occupancy, shall be protected with the more restrictive fire-resistance-rated assemblies of the groups involved as shown in Table 601. Means of egress for the upper occupancy shall conform to Chapter 10 and shall be separated from the parking occupancy by fire barriers having at least a 2-hour fire-resistance rating as required by Section 706 with self-closing doors complying with Section 715 or horizontal assemblies having at least a 2-hour fire-resistance rating as required by Section 711, with self-closing doors complying with Section 715. Means of egress from the open parking garage shall comply with Section 406.3.

509.8 Group B or M with Group S-2 open parking garage above. Group B or M uses located in the basement or first story below a Group S-2 open parking garage shall be classified as a separate and distinct building for the purpose of determining the type of construction when all of the following conditions are met:

1. The basement or first story shall be Type I or II construction, but not less than the type of construction required for the open parking garage above. The height and area of the basement or first story shall not exceed the limitations in Section 503 for the Group B or M uses.

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2. The height and area of the open parking garage shall not exceed the limitations permitted under Section 406.3. The height, in both feet and stories, of the open parking garage shall be measured from grade plane and include both the open parking garage and the basement or first story.
3. Fire separation assemblies between the open parking garage and the basement or first story use group shall correspond to the required fire-resistance rating prescribed by Table 508.3.3
4. Exits serving the open parking garage shall discharge directly to a street or public way and shall be separated from the basement or first story use group by not less than 2-hour fire barriers constructed in accordance with Section 706 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both, with opening protectives in accordance with Table 715.4.

FLORIDA BUILDING CODE

FINAL DRAFT

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CHAPTER 6

TYPES OF CONSTRUCTION

SECTION 601 GENERAL

601.1 Scope. The provisions of this chapter shall control the classification of buildings as to type of construction.

SECTION 602 CONSTRUCTION CLASSIFICATION

602.1 General. Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five construction types defined in Sections 602.2 through 602.5. The building elements shall have a fire-resistance rating not less than that specified in Table 601 and exterior walls shall have a fire-resistance rating not less than that specified in Table 602.

602.1.1 Minimum requirements. A building or portion thereof shall not be required to conform to the details of a type of construction higher than that type, which meets the minimum requirements based on occupancy even though certain features of such a building actually conform to a higher type of construction.

602.2 Types I and II. Type I and II construction are those types of construction in which the building elements listed in Table 601 are of noncombustible materials, except as permitted in Section 603 and elsewhere in this code.

602.3 Type III. Type III construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of any material permitted by this code. Fire-retardant-treated wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies of a 2-hour rating or less.

602.4 Type IV. Type IV construction (Heavy Timber, HT) is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid or laminated wood without concealed spaces. The details of Type IV construction shall comply with the provisions of this section. Fire-retardant-treated wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies with a 2-hour rating or less. Minimum solid sawn nominal dimensions are required for structures built using Type IV construction (HT). For glued-laminated members the equivalent net finished width and depths corresponding to the minimum nominal width and depths of solid sawn lumber are required as specified in Table 602.4.

602.4.1 Columns. Wood columns shall be sawn or glued laminated and shall not be less than 8 inches (203 mm), nominal, in any dimension where supporting floor loads and not less than 6 inches (152 mm) nominal in width and not less than 8 inches (203 mm) nominal in depth where supporting roof and ceiling loads only. Columns shall be continuous or superimposed and connected in an approved manner.

602.4.2 Floor framing. Wood beams and girders shall be of sawn or glued-laminated timber and shall be not less than 6 inches (152 mm) nominal in width and not less than 10 inches (254 mm) nominal in depth. Framed sawn or glued-laminated timber arches, which spring from the floor line and support floor loads, shall be not less than 8 inches (203 mm) nominal in any dimension. Framed timber trusses supporting floor loads shall have members of not less than 8 inches (203 mm) nominal in any dimension.

602.4.3 Roof framing. Wood-frame or glued-laminated arches for roof construction, which spring from the floor line or from grade and do not support floor loads, shall have members not less than 6 inches (152 mm) nominal in width and have less than 8 inches (203 mm) nominal in depth for the lower half of the height and not less than 6 inches (152 mm) nominal in depth for the upper half. Framed or glued-laminated arches for roof construction that spring from the top of walls or wall abutments, framed timber trusses and other roof framing, which do not support floor loads, shall have members not less than 4 inches (102 mm) nominal in width and not less than 6 inches (152 mm) nominal in depth. Spaced members shall be permitted to be composed of two or more pieces not less than 3 inches (76 mm) nominal in thickness where blocked solidly throughout their intervening spaces or where spaces are tightly closed by a continuous wood cover plate of not less than 2 inches (51 mm) nominal in thickness secured to the underside of the members. Splice plates shall be not less than 3 inches (76 mm) nominal in thickness. Where protected by approved automatic sprinklers under the roof deck, framing members shall be not less than 3 inches (76 mm) nominal in width.

602.4.4 Floors. Floors shall be without concealed spaces. Wood floors shall be of sawn or glued-laminated planks, splined or tongue-and-groove, of not less than 3 inches (76 mm) nominal in thickness covered with 1-inch (25 mm) nominal dimension tongue-and-groove flooring, laid crosswise or diagonally, or 0.5-inch (12.7 mm) particleboard or planks not less than 4 inches (102 mm) nominal in width set on edge close together and well spiked and covered with 1-inch (25 mm) nominal dimension flooring or $1\frac{5}{32}$ -inch (12 mm) wood structural panel or 0.5-inch (12.7 mm) particleboard. The lumber shall be laid so that no continuous line of joints will occur except at points of support. Floors shall not extend closer than 0.5 inch (12.7 mm) to walls. Such 0.5-inch (12.7 mm) space shall be covered by a molding fastened to the wall and so arranged that it will not obstruct the swelling or shrinkage movements of the floor. Corbeling of masonry walls under the floor shall be permitted to be used in place of molding.

602.4.5 Roofs. Roofs shall be without concealed spaces and wood roof decks shall be sawn or glued laminated, splined or tongue-and-groove plank, not less than 2 inches (51 mm) nominal in thickness, $1\frac{1}{8}$ -inch-thick (32 mm) wood structural panel (exterior glue), or of planks not less than 3 inches

(76 mm) nominal in width, set on edge close together and laid as required for floors. Other types of decking shall be permitted to be used if providing equivalent fire resistance and structural properties.

602.4.6 Partitions. Partitions shall be of solid wood construction formed by not less than two layers of 1-inch (25 mm) matched boards or laminated construction 4 inches (102 mm) thick, or of 1-hour fire-resistance-rated construction.

602.4.7 Exterior structural members. Where a horizontal separation of 20 feet (6096 mm) or more is provided, wood columns and arches conforming to heavy timber sizes shall be permitted to be used externally.

602.5 Type V. Type V construction is that type of construction in which the structural elements, exterior walls and interior walls are of any materials permitted by this code.

**SECTION 603
COMBUSTIBLE MATERIAL IN TYPE I
AND II CONSTRUCTION**

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or Type II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. Fire-retardant-treated wood shall be permitted in:
 - 1.1. Nonbearing partitions where the required fire-resistance rating is 2 hours or less.
 - 1.2. Nonbearing exterior walls where no fire rating is required.
 - 1.3. Roof construction, including girders, trusses, framing and decking.

Exception: In buildings of Type I construction exceeding two stories in height, fire-retardant-treated wood is not permitted in roof construction when the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

2. Thermal and acoustical insulation, other than foam plastics, having a flame spread index of not more than 25.

Exceptions:

1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a flame spread index of not more than 100.
2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a flame spread index of not more than 200.
3. Foam plastics in accordance with Chapter 26.
4. Roof coverings that have an A, B or C classification.

5. Interior floor finish and interior finish, trim and millwork such as doors, door frames, window sashes and frames.
6. Where not installed over 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
7. Finished flooring applied directly to the floor slab or to wood sleepers that are fireblocked in accordance with Section 717.2.7.
8. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a corridor serving an occupant load of 30 or more shall be permitted to be constructed of fire-retardant-treated wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
9. Stages and platforms constructed in accordance with Sections 410.3 and 410.4, respectively.
10. Combustible exterior wall coverings, balconies and similar projections and bay or oriel windows in accordance with Chapter 14.
11. Blocking such as for handrails, millwork, cabinets and window and door frames.
12. Light-transmitting plastics as permitted by Chapter 26.
13. Mastics and caulking materials applied to provide flexible seals between components of exterior wall construction.
14. Exterior plastic veneer installed in accordance with Section 2605.2.
15. Nailing or furring strips as permitted by Section 803.4.
16. Heavy timber as permitted by Note d to Table 601 and Sections 602.4.7 and 1406.3.
17. Aggregates, component materials and admixtures as permitted by Section 703.2.2.
18. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of fire-resistance tests in accordance with Section 703.2 and installed in accordance with Section 1704.10 and 1704.11, respectively.
19. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 712.
20. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 713.
21. Materials allowed in the concealed spaces of buildings of Type I and II construction in accordance with Section 717.5.
22. Materials exposed within plenums complying with Section 602 of the *Florida Building Code, Mechanical*. ||

603.1.1 Ducts. The use of nonmetallic ducts shall be permitted when installed in accordance with the limitations of the *Florida Building Code, Mechanical*. ||

603.1.2 Piping. The use of combustible piping materials shall be permitted when installed in accordance with the limitations of the *Florida Building Code, Mechanical* and the *Florida Building Code, Plumbing*.

603.1.3 Electrical. The use of electrical wiring methods with combustible insulation, tubing, raceways and related components shall be permitted when installed in accordance with the limitations of Chapter 27 of the *Florida Building Code, Building*.

**TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)**

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Structural frame ^a	3 ^{b,h}	2 ^b	1	0	1	0	HT	1	0
Bearing walls									
Exterior ^g	4	3	1	0	2	2	2	1	0
Interior	4 ^b	3 ^b	1	0	1	0	2 ^b /HT	1	0
Nonbearing walls and partitions	See Table 602								
Exterior									
Nonbearing walls and partitions							See Section 602.4.6		
Interior ^f	0	0	0	0	0	0		0	0
Floor construction									
Including supporting beams and joists	3 ^h	2	1 ^e	0 ^{e,i}	1 ^e	0 ^{e,i}	HT	1	0 ⁱ
Roof construction									
Including supporting beams and joists	1 1/2 ^{c,h}	1 ^{c,d}	1 ^{c,d}	0 ^d	1 ^d	0 ^d	HT	1 ^{c,d}	0

For SI: 1 foot = 304.8 mm.

- a. The structural frame shall be considered to be the columns and the girders, beams, trusses and spandrels having direct connections to the columns and bracing members designed to carry gravity loads. The members of floor or roof panels which have no connection to the columns shall be considered secondary members and not a part of the structural frame.
- b. Fire-resistance ratings of structural frame and bearing walls are permitted to be reduced by 1 hour where supporting one floor or one roof only.
- c. Except in Group F-1, H, I, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
- d. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.
- e. Group B and M occupancies of Type II or III construction five or more stories in height shall be required to have a minimum 2-hour fire-resistance rating for the floor construction located over the basement.
- f. Not less than the fire-resistance rating required by other sections of this code.
- g. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
- h. For Group A, B, E, F and R occupancies and parking garages, the required fire-resistance ratings for the structural frame, floor and roof construction, including supporting beams and joists, shall be permitted to be reduced by 1 hour where the building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, but the fire-resistance rating shall not be less than 1 hour.
- i. For unsprinklered Group E occupancies of Type, IIB, IIIB, IV or VB construction, the floor construction located immediately above useable space in basements shall have a fire-resistance rating of not less than 1 hour.

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE^{a, e}

FIRE SEPARATION DISTANCE = x (feet)	TYPE OF CONSTRUCTION	GROUP H	GROUP F-1, M, S-1	GROUP A, B, E, F-2, I, R, S-2, U ^b
$x < 5^c$	I-A, I-B, III-A, III-B, IV	3	3	3
	Others	3	2	1
$5 \leq x < 10$	I-A, I-B, III-A, III-B, IV	3	2	2
	Others	2	1	1
$10 \leq x < 20$	I-A, I-B, III-A, III-B, IV	2	2	2
	IIB, VB	1	0	0
	Others	1	1	1
$20 \leq x < 30$	I-A, I-B, III-A, III-B, IV	1	1	1 ^d
	Others	1	0	0 ^d
$x \geq 30$	All	0	0	0

For SI: 1 foot = 304.8 mm.

- a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
- b. For special requirements for Group U occupancies see Section 406.1.2
- c. See Section 705.1.1 for party walls.
- d. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
- e. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.

TABLE 602.4
WOOD MEMBER SIZE

MINIMUM NOMINAL SOLID SAWN SIZE		MINIMUM GLUED-LAMINATED NET SIZE	
Width, inch	Depth, inch	Width, inch	Depth, inch
8	8	6 3/4	8 1/4
6	10	5	10 1/2
6	8	5	8 1/4
6	6	5	6
4	6	3	6 7/8

For SI: 1 inch = 25.4 mm.

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CHAPTER 7

FIRE-RESISTANCE-RATED CONSTRUCTION

SECTION 701 GENERAL

701.1 Scope. The provisions of this chapter shall govern the materials and assemblies used for structural fire resistance and fire-resistance-rated construction separation of adjacent spaces to safeguard against the spread of fire and smoke within a building and the spread of fire to or from buildings.

SECTION 702 DEFINITIONS

702.1 Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.

ANNULAR SPACE. The opening around the penetrating item.

CEILING RADIATION DAMPER. A listed device installed in a ceiling membrane of a fire-resistance-rated floor/ceiling or roof/ceiling assembly to limit automatically the radiative heat transfer through an air inlet/outlet opening.

COMBINATION FIRE/SMOKE DAMPER. A listed device installed in ducts and air transfer openings designed to close automatically upon the detection of heat and resist the passage of flame and smoke. The device is installed to operate automatically, controlled by a smoke detection system, and where required, is capable of being positioned from a fire command center.

DAMPER. See “Ceiling radiation damper,” “Combination fire/smoke damper,” “Fire damper” and “Smoke damper.”

DRAFTSTOP. A material, device or construction installed to restrict the movement of air within open spaces of concealed areas of building components such as crawl spaces, floor/ceiling assemblies, roof/ceiling assemblies and attics.

F RATING. The time period that the through-penetration firestop system limits the spread of fire through the penetration when tested in accordance with ASTM E 814.

FIRE AREA. The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or fire-resistance-rated horizontal assemblies of a building.

FIRE BARRIER. A fire-resistance-rated wall assembly of materials designed to restrict the spread of fire in which continuity is maintained.

FIRE DAMPER. A listed device installed in ducts and air transfer openings designed to close automatically upon detection of heat and resist the passage of flame. Fire dampers are classified for use in either static systems that will automatically shut down in the event of a fire, or in dynamic systems that continue to operate during a fire. A dynamic fire damper is tested and rated for closure under elevated temperature airflow.

FIRE DOOR. The door component of a fire door assembly.

FIRE DOOR ASSEMBLY. Any combination of a fire door, frame, hardware, and other accessories that together provide a specific degree of fire protection to the opening.

FIRE PARTITION. A vertical assembly of materials designed to restrict the spread of fire in which openings are protected.

FIRE PROTECTION RATING. The period of time that an opening protective assembly will maintain the ability to confine a fire as determined by tests prescribed in Section 715. Ratings are stated in hours or minutes.

FIRE RESISTANCE. That property of materials or their assemblies that prevents or retards the passage of excessive heat, hot gases or flames under conditions of use.

FIRE-RESISTANCE RATING. The period of time a building element, component or assembly maintains the ability to confine a fire, continues to perform a given structural function, or both, as determined by the tests, or the methods based on tests, prescribed in Section 703.

FIRE-RESISTANT JOINT SYSTEM. An assemblage of specific materials or products that are designed, tested, and fire-resistance rated in accordance with either ASTM E 1966 or UL 2079 to resist for a prescribed period of time the passage of fire through joints made in or between fire-resistance-rated assemblies.

FIRE SEPARATION DISTANCE. The distance measured from the building face to one of the following:

1. The closest interior lot line;
2. To the centerline of a street, an alley or public way; or
3. To an imaginary line between two buildings on the property.

The distance shall be measured at right angles from the face of the wall.

FIRE WALL. A fire-resistance-rated wall having protected openings, which restricts the spread of fire and extends continuously from the foundation to or through the roof, with sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall.

FIRE WINDOW ASSEMBLY. A window constructed and glazed to give protection against the passage of fire.

FIREBLOCKING. Building materials installed to resist the free passage of flame to other areas of the building through concealed spaces.

FLOOR FIRE DOOR ASSEMBLY. A combination of a fire door, a frame, hardware and other accessories installed in a horizontal plane, which together provide a specific degree of fire protection to a through-opening in a fire-resistance-rated floor (see Section 711.8).

HORIZONTAL ASSEMBLY. A fire-resistance-rated floor or roof assembly of materials designed to restrict the spread of fire in which continuity is maintained.

JOINT. The linear opening in or between adjacent fire-resistance-rated assemblies that is designed to allow independent movement of the building in any plane caused by thermal, wind or any other loading.

MEMBRANE PENETRATION. An opening made through one side (wall, floor or ceiling membrane) of an assembly.

MEMBRANE-PENETRATION FIRESTOP. A material, device or construction installed to resist for a prescribed time period the passage of flame and heat through openings in a protective membrane in order to accommodate cables, cable trays, conduit, tubing, pipes or similar items.

MINERAL FIBER. Insulation composed principally of fibers manufactured from rock, slag or glass, with or without binders.

MINERAL WOOL. Synthetic vitreous fiber insulation made by melting predominately igneous rock or furnace slag, and other inorganic materials, and then physically forming the melt into fibers.

PENETRATION FIRESTOP. A through-penetration firestop or a membrane-penetration firestop.

SELF-CLOSING. As applied to a fire door or other opening, means equipped with an approved device that will ensure closing after having been opened.

SHAFT. An enclosed space extending through one or more stories of a building, connecting vertical openings in successive floors, or floors and roof.

SHAFT ENCLOSURE. The walls or construction forming the boundaries of a shaft.

SMOKE BARRIER. A continuous membrane, either vertical or horizontal, such as a wall, floor, or ceiling assembly, that is designed and constructed to restrict the movement of smoke.

SMOKE COMPARTMENT. A space within a building enclosed by smoke barriers on all sides, including the top and bottom.

SMOKE DAMPER. A listed device installed in ducts and air transfer openings designed to resist the passage of smoke. The device is installed to operate automatically, controlled by a smoke detection system, and where required, is capable of being positioned from a fire command center.

SPLICE. The result of a factory and/or field method of joining or connecting two or more lengths of a fire-resistant joint system into a continuous entity.

T RATING. The time period that the penetration firestop system, including the penetrating item, limits the maximum temperature rise to 325°F (163°C) above its initial temperature through the penetration on the nonfire side when tested in accordance with ASTM E 814.

THROUGH PENETRATION. An opening that passes through an entire assembly.

THROUGH-PENETRATION FIRESTOP SYSTEM. An assemblage of specific materials or products that are designed, tested and fire-resistance rated to resist for a prescribed period

of time the spread of fire through penetrations. The F and T rating criteria for penetration firestop systems shall be in accordance with ASTM E 814. See definitions of “F rating” and “T rating.”

SECTION 703 FIRE-RESISTANCE RATINGS AND FIRE TESTS

703.1 Scope. Materials prescribed herein for fire resistance shall conform to the requirements of this chapter.

703.2 Fire-resistance ratings. The fire-resistance rating of building elements shall be determined in accordance with the test procedures set forth in ASTM E 119 or in accordance with Section 703.3. Where materials, systems or devices that have not been tested as part of a fire-resistance-rated assembly are incorporated into the assembly, sufficient data shall be made available to the building official to show that the required fire-resistance rating is not reduced. Materials and methods of construction used to protect joints and penetrations in fire-resistance-rated building elements shall not reduce the required fire-resistance rating.

Exception: In determining the fire-resistance rating of exterior bearing walls, compliance with the ASTM E 119 criteria for unexposed surface temperature rise and ignition of cotton waste due to passage of flame or gases is required only for a period of time corresponding to the required fire-resistance rating of an exterior nonbearing wall with the same fire separation distance, and in a building of the same group. When the fire-resistance rating determined in accordance with this exception exceeds the fire-resistance rating determined in accordance with ASTM E 119, the fire exposure time period, water pressure, and application duration criteria for the hose stream test of ASTM E 119 shall be based upon the fire-resistance rating determined in accordance with this exception.

703.2.1 Nonsymmetrical wall construction. Interior walls and partitions of nonsymmetrical construction shall be tested with both faces exposed to the furnace, and the assigned fire-resistance rating shall be the shortest duration obtained from the two tests conducted in compliance with ASTM E 119. When evidence is furnished to show that the wall was tested with the least fire-resistant side exposed to the furnace, subject to acceptance of the building official, the wall need not be subjected to tests from the opposite side (see Section 704.5 for exterior walls).

703.2.2 Combustible components. Combustible aggregates are permitted in gypsum and portland cement concrete mixtures approved for fire-resistance-rated construction. Any approved component material or admixture is permitted in assemblies if the resulting tested assembly meets the fire-resistance test requirements of this code.

703.2.3 Restrained classification. Fire-resistance-rated assemblies tested under ASTM E 119 shall not be considered to be restrained unless evidence satisfactory to the building official is furnished by the registered design professional showing that the construction qualifies for a restrained classification in accordance with ASTM E 119. Restrained construction shall be identified on the plans.

703.3 Alternative methods for determining fire resistance. The application of any of the alternative methods listed in this section shall be based on the fire exposure and acceptance criteria specified in ASTM E 119. The required fire resistance of a building element shall be permitted to be established by any of the following methods or procedures:

1. Fire-resistance designs documented in approved sources.
2. Prescriptive designs of fire-resistance-rated building elements as prescribed in Section 720.
3. Calculations in accordance with Section 721.
4. Engineering analysis based on a comparison of building element designs having fire-resistance ratings as determined by the test procedures set forth in ASTM E 119.
5. Alternative protection methods as allowed by Section 104.11.

703.4 Noncombustibility tests. The tests indicated in Sections 703.4.1 and 703.4.2 shall serve as criteria for acceptance of building materials as set forth in Sections 602.2, 602.3 and 602.4 in Type I, II, III and IV construction. The term “noncombustible” does not apply to the flame spread characteristics of interior finish or trim materials. A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or flame spread beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions.

703.4.1 Elementary materials. Materials required to be noncombustible shall be tested in accordance with ASTM E 136.

703.4.2 Composite materials. Materials having a structural base of noncombustible material as determined in accordance with Section 703.4.1 with a surfacing not more than 0.125 inch (3.18 mm) thick that has a flame spread index not greater than 50 when tested in accordance with ASTM E 84 shall be acceptable as noncombustible materials.

SECTION 704 EXTERIOR WALLS

704.1 General. Exterior walls shall comply with this section.

704.2 Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the floor area shall conform to the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways shall also comply with Sections 1014.5 and 1023.1, respectively. Projections shall not extend beyond the distance determined by the following two methods, whichever results in the lesser projection:

1. A point one-third the distance to the lot line from an assumed vertical plane located where protected openings are required in accordance with Section 704.8.
2. More than 12 inches (305 mm) into areas where openings are prohibited.

704.2.1 Type I and II construction. Projections from walls of Type I or II construction shall be of noncombustible materials or combustible materials as allowed by Sections 1406.3 and 1406.4.

704.2.2 Type III, IV or V construction. Projections from walls of Type III, IV or V construction shall be of any approved material.

704.2.3 Combustible projections. Combustible projections located where openings are not permitted or where protection of openings is required shall be of at least 1-hour fire-resistance-rated construction, Type IV construction, fire-retardant-treated wood or as required by Section 1406.3.

Exception: Type V construction shall be allowed for R-3 occupancies.

704.3 Buildings on the same lot. For the purposes of determining the required wall and opening protection and roof-covering requirements, buildings on the same lot shall be assumed to have an imaginary line between them.

Where a new building is to be erected on the same lot as an existing building, the location of the assumed imaginary line with relation to the existing building shall be such that the exterior wall and opening protection of the existing building meet the criteria as set forth in Sections 704.5 and 704.8.

Exception: Two or more buildings on the same lot shall either be regulated as separate buildings or shall be considered as portions of one building if the aggregate area of such buildings is within the limits specified in Chapter 5 for a single building. Where the buildings contain different occupancy groups or are of different types of construction, the area shall be that allowed for the most restrictive occupancy or construction.

704.4 Materials. Exterior walls shall be of materials permitted by the building type of construction.

704.5 Fire-resistance ratings. Exterior walls shall be fire-resistance rated in accordance with Tables 601 and 602. The fire-resistance rating of exterior walls with a fire separation distance of greater than 5 feet (1524 mm) shall be rated for exposure to fire from the inside. The fire-resistance rating of exterior walls with a fire separation distance of 5 feet (1524 mm) or less shall be rated for exposure to fire from both sides.

704.6 Structural stability. The wall shall extend to the height required by Section 704.11 and shall have sufficient structural stability such that it will remain in place for the duration of time indicated by the required fire-resistance rating.

704.7 Unexposed surface temperature. Where protected openings are not limited by Section 704.8, the limitation on the rise of temperature on the unexposed surface of exterior walls as required by ASTM E 119 shall not apply. Where protected openings are limited by Section 704.8, the limitation on the rise of temperature on the unexposed surface of exterior walls as required by ASTM E 119 shall not apply provided that a correction is made for radiation from the unexposed exterior wall surface in accordance with the following formula:

$$A_e = A + (A_f \times F_{co}) \quad (\text{Equation 7-1})$$

FIRE-RESISTANCE-RATED CONSTRUCTION

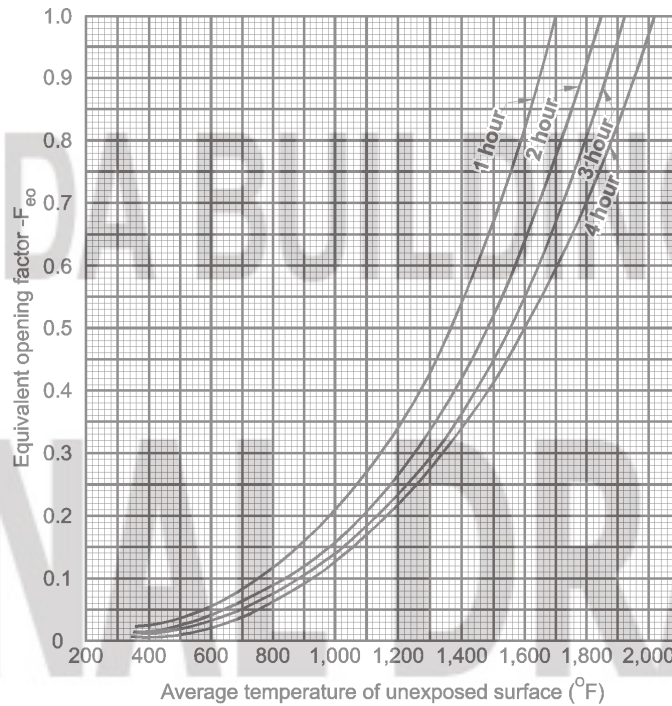
where:

- A_e = Equivalent area of protected openings.
- A = Actual area of protected openings.
- A_f = Area of exterior wall surface in the story under consideration exclusive of openings, on which the temperature limitations of ASTM E 119 for walls are exceeded.
- F_{eo} = An “equivalent opening factor” derived from Figure 704.7 based on the average temperature of the unex-

posed wall surface and the fire-resistance rating of the wall.

704.8 Allowable area of openings. The maximum area of unprotected or protected openings permitted in an exterior wall in any story shall not exceed the values set forth in Table 704.8. Where both unprotected and protected openings are located in the exterior wall in any story, the total area of the openings shall comply with the following formula:

$$\frac{A}{a} + \frac{A_u}{a_u} \leq 1.0 \quad \text{(Equation 7-2)}$$



For SI: °C = [(°F) - 32] / 1.8.

**FIGURE 704.7
EQUIVALENT OPENING FACTOR**

**TABLE 704.8
MAXIMUM AREA OF EXTERIOR WALL OPENINGS^a**

CLASSIFICATION OF OPENING	FIRE SEPARATION DISTANCE (feet)							
	0 to 3 ^{f,j}	Greater than 3 to 5 ^{c,g}	Greater than 5 to 10 ^{c,e,g,h}	Greater than 10 to 15 ^{d,e,g}	Greater than 15 to 20 ^{d,g}	Greater than 20 to 25 ^{d,g}	Greater than 25 to 30 ^{d,g}	Greater than 30
Unprotected	Not Permitted	Not Permitted ^c	10% ⁱ	15% ⁱ	25% ⁱ	45% ⁱ	70% ⁱ	No Limit
Protected	Not Permitted	15%	25%	45%	75%	No Limit	No Limit	No Limit

For SI: 1 foot = 304.8 mm.

- a. Values given are percentage of the area of the exterior wall.
- b. Deleted.
- c. For occupancies in Group R-3, the maximum percentage of unprotected and protected exterior wall openings shall be 25 percent.
- d. The area of openings in an open parking structure with a fire separation distance of greater than 10 feet shall not be limited.
- e. For occupancies in Group H-2 or H-3, unprotected openings shall not be permitted for openings with a fire separation distance of 15 feet or less.
- f. For requirements for fire walls for buildings with differing roof heights, see Section 705.6.1.
- g. The area of unprotected and protected openings is not limited for occupancies in Group R-3, with a fire separation distance greater than 5 feet.
- h. For special requirements for Group U occupancies, see Section 406.1.2.
- i. Buildings whose exterior bearing wall, exterior nonbearing wall and exterior structural frame are not required to be fire-resistance rated by Table 601 or 602 shall be permitted to have unlimited unprotected openings.
- j. Includes accessory buildings to Group R-3.

where:

- A = Actual area of protected openings, or the equivalent area of protected openings, A_e (see Section 704.7).
 a = Allowable area of protected openings.
 A_u = Actual area of unprotected openings.
 a_u = Allowable area of unprotected openings.

704.8.1 Automatic sprinkler system. In buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the maximum allowable area of unprotected openings in occupancies other than Groups H-1, H-2 and H-3 shall be the same as the tabulated limitations for protected openings.

704.8.2 First story. In occupancies other than Group H, unlimited unprotected openings are permitted in the first story of exterior walls facing a street that have a fire separation distance of greater than 15 feet (4572 mm) or facing an unoccupied space. The unoccupied space shall be on the same lot or dedicated for public use, shall not be less than 30 feet (9144 mm) in width and shall have access from a street by a posted fire lane in accordance with the *Florida Fire Prevention Code*.

704.9 Vertical separation of openings. Openings in exterior walls in adjacent stories shall be separated vertically to protect against fire spread on the exterior of the buildings where the openings are within 5 feet (1524 mm) of each other horizontally and the opening in the lower story is not a protected opening with a fire protection rating of not less than $3/4$ hour. Such openings shall be separated vertically at least 3 feet (914 mm) by spandrel girders, exterior walls or other similar assemblies that have a fire-resistance rating of at least 1 hour or by flame barriers that extend horizontally at least 30 inches (762 mm) beyond the exterior wall. Flame barriers shall also have a fire-resistance rating of at least 1 hour. The unexposed surface temperature limitations specified in ASTM E 119 shall not apply to the flame barriers or vertical separation unless otherwise required by the provisions of this code.

Exceptions:

1. This section shall not apply to buildings that are three stories or less in height.
2. This section shall not apply to buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Open parking garages.

704.10 Vertical exposure. For buildings on the same lot, opening protectives having a fire-protection rating of not less than $3/4$ hour shall be provided in every opening that is less than 15 feet (4572 mm) vertically above the roof of an adjoining building or adjacent structure that is within a horizontal fire separation distance of 15 feet (4572 mm) of the wall in which the opening is located.

Exception: Opening protectives are not required where the roof construction has a fire-resistance rating of not less than 1 hour for a minimum distance of 10 feet (3048 mm) from the adjoining building, and the entire length and span of the

supporting elements for the fire-resistance-rated roof assembly has a fire-resistance rating of not less than 1 hour.

704.11 Parapets. Parapets shall be provided on exterior walls of buildings.

Exceptions: A parapet need not be provided on an exterior wall where any of the following conditions exist:

1. The wall is not required to be fire-resistance rated in accordance with Table 602 because of fire separation distance.
2. The building has an area of not more than 1,000 square feet (93 m²) on any floor.
3. Walls that terminate at roofs of not less than 2-hour fire-resistance-rated construction or where the roof, including the deck or slab and supporting construction, is constructed entirely of noncombustible materials.
4. One-hour fire-resistance-rated exterior walls that terminate at the underside of the roof sheathing, deck or slab, provided:
 - 4.1. Where the roof/ceiling framing elements are parallel to the walls, such framing and elements supporting such framing shall not be of less than 1-hour fire-resistance-rated construction for a width of 4 feet (1220 mm) for Groups R and U and 10 feet (3048 mm) for other occupancies, measured from the interior side of the wall.
 - 4.2. Where roof/ceiling framing elements are not parallel to the wall, the entire span of such framing and elements supporting such framing shall not be of less than 1-hour fire-resistance-rated construction.
 - 4.3. Openings in the roof shall not be located within 5 feet (1524 mm) of the 1-hour fire-resistance-rated exterior wall for Groups R and U and 10 feet (3048 mm) for other occupancies, measured from the interior side of the wall.
 - 4.4. The entire building shall be provided with not less than a Class B roof covering.
5. In Groups R-2 and R-3 where the entire building is provided with a Class C roof covering, the exterior wall shall be permitted to terminate at the underside of the roof sheathing or deck in Type III, IV and V construction, provided:
 - 5.1. The roof sheathing or deck is constructed of approved noncombustible materials or of fire-retardant-treated wood for a distance of 4 feet (1220 mm); or
 - 5.2. The roof is protected with 0.625-inch (16 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of nominal 2-inch (51 mm) ledgers attached to the sides of the roof

framing members for a minimum distance of 4 feet (1220 mm).

6. Where the wall is permitted to have at least 25 percent of the exterior wall areas containing unprotected openings based on fire separation distance as determined in accordance with Section 704.8.

704.11.1 Parapet construction. Parapets shall have the same fire-resistance rating as that required for the supporting wall, and on any side adjacent to a roof surface, shall have noncombustible faces for the uppermost 18 inches (457 mm), including counterflashing and coping materials. The height of the parapet shall not be less than 30 inches (762 mm) above the point where the roof surface and the wall intersect. Where the roof slopes toward a parapet at a slope greater than two units vertical in 12 units horizontal (16.7-percent slope), the parapet shall extend to the same height as any portion of the roof within a fire separation distance where protection of wall openings is required, but in no case shall the height be less than 30 inches (762 mm).

704.12 Opening protection. Windows in exterior walls required to have protected openings in accordance with other sections of this code or determined to be protected in accordance with Section 704.3 or 704.8 shall comply with Section 715.5. Other openings required to be protected with fire door or shutter assemblies in accordance with other sections of this code or determined to be protected in accordance with Section 704.3 or 704.8 shall comply with Section 715.4.

Exception: Opening protectives are not required where the building is protected throughout by an automatic sprinkler system and the exterior openings are protected by an approved water curtain using automatic sprinklers approved for that use. The sprinklers and the water curtain shall be installed in accordance with Section 903.3.1.1 and shall have an automatic water supply and fire department connection.

704.12.1 Unprotected openings. Where protected openings are not required by Section 704, windows and doors shall be constructed of any approved materials. Glazing shall conform to the requirements of Chapters 24 and 26.

704.13 Joints. Joints made in or between exterior walls required by this section to have a fire-resistance rating shall comply with Section 713.

Exception: Joints in exterior walls that are permitted to have unprotected openings.

704.13.1 Voids. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 713.4.

704.14 Ducts and air transfer openings. Penetrations by air ducts and air transfer openings in fire-resistance-rated exterior walls required to have protected openings shall comply with Section 716.

Exception: Foundation vents installed in accordance with this code are permitted.

**SECTION 705
FIRE WALLS**

705.1 General. Each portion of a building separated by one or more fire walls that comply with the provisions of this section shall be considered a separate building. For the purposes of determining height and area in accordance with Table 503, fire walls dividing buildings into separate buildings shall provide a 4-hour fire-resistance rating. The extent and location of such fire walls shall provide a complete separation. Where a fire wall also separates occupancies that are required to be separated by a fire barrier wall, the most restrictive requirements of each separation shall apply.

705.1.1 Party walls. Any wall located on a lot line between adjacent buildings, which is used or adapted for joint service between the two buildings, shall be constructed as a fire wall and shall provide a 4-hour fire-resistance rating in accordance with Section 705, without openings and shall create separate buildings.

705.2 Structural stability. Fire walls shall have sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall for the duration of time indicated by the required fire-resistance rating.

705.3 Materials. Fire walls shall be constructed of any approved noncombustible materials.

705.4 Fire-resistance rating. Fire walls shall have a fire-resistance rating of not less than that required by Table 705.4.

**TABLE 705.4
FIRE WALL FIRE-RESISTANCE RATINGS^c**

GROUP	FIRE-RESISTANCE RATING (hours)
A, B, D, E, H-4, I, R-1, R-2, U	3 ^a
F-1, H-3 ^b , H-5, M, S-1	3
H-1, H-2	4 ^b
F-2, S-2, R-3, R-4	2

a. Walls shall be not less than 2-hour fire-resistance rated where separating buildings of Type II or V construction.

b. For Group H-1, H-2 or H-3 buildings, also see Sections 415.4 and 415.5.

c. For the purposes of determining height and area in accordance with Table 503, fire walls dividing buildings into separate buildings shall provide a 4-hour fire-resistance rating.

705.4.1 Townhouse fire separation.

705.4.1.1 Each townhouse shall be considered a separate building and shall be separated from adjoining townhouses by a party wall complying with Section 503.2 or by the use of separate exterior walls meeting the requirements of Tables 601 and 602 for zero clearance from property lines as required for the type of construction. Separate exterior walls shall include one of the following:

1. A parapet not less than 18 inches (457 mm) above the roof line.
2. Roof sheathing of noncombustible material or fire retardant-treated wood, for not less than a 4 foot (1219 mm) width on each side of the exterior dividing wall.

3. One layer of $\frac{5}{8}$ -inch (15.9 mm) Type X gypsum board attached to the underside of roof decking, for not less than a 4 foot (1219 mm) width on each side of the exterior dividing wall.

705.4.1.2 When not more than three stories in height, townhouses may be separated by a single wall meeting the following requirements:

1. Such wall shall provide not less than a 2-hour fire-resistance rating. Plumbing, piping, ducts, electrical or other building services shall not be installed within or through the 2-hour wall unless such materials and methods of penetration have been tested in accordance with Section 703.
2. Such wall shall be continuous from the foundation to the underside of the roof sheathing or shall have a parapet extending not less than 18 inches (457 mm) and no less than a 4-foot (1219 mm) width on each side of the wall shall be of noncombustible material, or fire-retardant-treated wood, or one layer of $\frac{5}{8}$ -inch (15.9 mm) Type X gypsum wall-board attached to the underside of the roof decking.
3. Each dwelling unit sharing such wall shall be designed and constructed to maintain its structural integrity independent of the unit on the opposite side of the wall.

Exception: Said wall may be penetrated by roof and floor structural members provided that the fire-resistance rating and the structural integrity of the wall are maintained.

705.5 Horizontal continuity. Fire walls shall be continuous from exterior wall to exterior wall and shall extend at least 18 inches (457 mm) beyond the exterior surface of exterior walls.

Exceptions:

1. Fire walls shall be permitted to terminate at the interior surface of combustible exterior sheathing or siding provided the exterior wall has a fire-resistance rating of at least 1 hour for a horizontal distance of at least 4 feet (1220 mm) on both sides of the fire wall. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than $\frac{3}{4}$ hour.
2. Fire walls shall be permitted to terminate at the interior surface of noncombustible exterior sheathing, exterior siding or other noncombustible exterior finishes provided the sheathing, siding, or other exterior noncombustible finish extends a horizontal distance of at least 4 feet (1220 mm) on both sides of the fire wall.
3. Fire walls shall be permitted to terminate at the interior surface of noncombustible exterior sheathing where the building on each side of the fire wall is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

705.5.1 Exterior walls. Where the fire wall intersects the exterior walls, the fire-resistance rating for the exterior walls on both sides of the fire wall shall have a 1-hour fire-resistance rating with $\frac{3}{4}$ -hour opening protection where opening protection is required. The fire-resistance rating of the exterior wall shall extend a minimum of 4 feet (1220 mm) on each side of the intersection of the fire wall to exterior wall. Exterior wall intersections at fire walls that form an angle equal to or greater than 180 degrees (3.14 rad) do not need exterior wall protection.

705.5.2 Horizontal projecting elements. Fire walls shall extend to the outer edge of horizontal projecting elements such as balconies, roof overhangs, canopies, marquees and similar projections that are within 4 feet (1220 mm) of the fire wall.

Exceptions:

1. Horizontal projecting elements without concealed spaces, provided the exterior wall behind and below the projecting element has not less than 1-hour fire-resistance-rated construction for a distance not less than the depth of the projecting element on both sides of the fire wall. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than $\frac{3}{4}$ hour.
2. Noncombustible horizontal projecting elements with concealed spaces, provided a minimum 1-hour fire-resistance-rated wall extends through the concealed space. The projecting element shall be separated from the building by a minimum of 1-hour fire-resistance-rated construction for a distance on each side of the fire wall equal to the depth of the projecting element. The wall is not required to extend under the projecting element where the building exterior wall is not less than 1-hour fire-resistance rated for a distance on each side of the fire wall equal to the depth of the projecting element. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than $\frac{3}{4}$ hour.
3. For combustible horizontal projecting elements with concealed spaces, the fire wall need only extend through the concealed space to the outer edges of the projecting elements. The exterior wall behind and below the projecting element shall be of not less than 1-hour fire-resistance-rated construction for a distance not less than the depth of the projecting elements on both sides of the fire wall. Openings within such exterior walls shall be protected by opening protectives having a fire-protection rating of not less than $\frac{3}{4}$ hour.

705.6 Vertical continuity. Fire walls shall extend from the foundation to a termination point at least 30 inches (762 mm) above both adjacent roofs.

Exceptions:

1. Stepped buildings in accordance with Section 705.6.1.
2. Two-hour fire-resistance-rated walls shall be permitted to terminate at the underside of the roof sheathing, deck or slab provided:
 - 2.1. The lower roof assembly within 4 feet (1220 mm) of the wall has not less than a 1-hour fire-resistance rating and the entire length and span of supporting elements for the rated roof assembly has a fire-resistance rating of not less than 1 hour.
 - 2.2. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.
 - 2.3. Each building shall be provided with not less than a Class B roof covering.
3. Walls shall be permitted to terminate at the underside of noncombustible roof sheathing, deck, or slabs where both buildings are provided with not less than a Class B roof covering. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.
4. In buildings of Type III, IV and V construction, walls shall be permitted to terminate at the underside of combustibles roof sheathing or decks provided:
 - 4.1. There are no openings in the roof within 4 feet (1220 mm) of the fire wall,
 - 4.2. The roof is covered with a minimum Class B roof covering, and
 - 4.3. The roof sheathing or deck is constructed of fire-retardant-treated wood for a distance of 4 feet (1220 mm) on both sides of the wall or the roof is protected with $\frac{5}{8}$ inch (15.9 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of 2-inch (51 mm) nominal ledgers attached to the sides of the roof framing members for a minimum distance of 4 feet (1220 mm) on both sides of the fire wall.
5. Buildings located above a parking garage designed in accordance with Section 509.2 shall be permitted to have the fire walls for the buildings located above the parking garage extend from the horizontal separation between the parking garage and the buildings.

705.6.1 Stepped buildings. Where a fire wall serves as an exterior wall for a building and separates buildings having different roof levels, such wall shall terminate at a point not less than 30 inches (762 mm) above the lower roof level, provided the exterior wall for a height of 15 feet (4572 mm) above the lower roof is not less than 1-hour fire-resistance-rated construction from both sides with openings protected by fire assemblies having a fire protection rating of not less than $\frac{3}{4}$ hour.

Exception: Where the fire wall terminates at the underside of the roof sheathing, deck or slab of the lower roof, provided:

1. The lower roof assembly within 10 feet (3048 mm) of the wall has not less than a 1-hour fire-resistance rating and the entire length and span of supporting elements for the rated roof assembly has a fire-resistance rating of not less than 1 hour.
2. Openings in the lower roof shall not be located within 10 feet (3048 mm) of the fire wall.

705.7 Combustible framing in fire walls. Adjacent combustible members entering into a concrete or masonry fire wall from opposite sides shall not have less than a 4-inch (102 mm) distance between embedded ends. Where combustible members frame into hollow walls or walls of hollow units, hollow spaces shall be solidly filled for the full thickness of the wall and for a distance not less than 4 inches (102 mm) above, below and between the structural members, with noncombustible materials approved for fireblocking.

705.8 Openings. Each opening through a fire wall shall be protected in accordance with Section 715.4 and shall not exceed 120 square feet (11 m²). The aggregate width of openings at any floor level shall not exceed 25 percent of the length of the wall.

Exceptions:

1. Openings are not permitted in party walls constructed in accordance with Section 705.1.1.
2. Openings shall not be limited to 120 square feet (11 m²) where both buildings are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

705.9 Penetrations. Penetrations of fire walls shall comply with Section 712.

705.10 Joints. Joints made in or between fire walls shall comply with Section 713.

705.11 Ducts and air transfer openings. Ducts and air transfer openings shall not penetrate fire walls.

Exception: Penetrations by ducts and air transfer openings of fire walls that are not on a lot line shall be allowed provided the penetrations comply with Sections 712 and 716. The size and aggregate width of all openings shall not exceed the limitations of Section 705.8.

**SECTION 706
FIRE BARRIERS**

706.1 General. Fire barriers installed as required elsewhere in this code or the *Florida Fire Prevention Code* shall comply with this section.

706.2 Materials. Fire barriers shall be of materials permitted by the building type of construction.

706.2.1 Fire-resistance-rated glazing. Fire-resistance-rated glazing, when tested in accordance with ASTM E 119 and complying with the requirements of Section 706, shall be permitted. Fire-resistance-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and the identifier "W-XXX," where the "XXX" is the fire-resistance rating in minutes. Such label or identification shall be issued by an approved agency and shall be permanently affixed to the glazing.

706.3 Fire-resistance rating. The fire-resistance rating of fire barriers shall comply with this section.

706.3.1 Shaft enclosures. The fire-resistance rating of the fire barrier separating building areas from a shaft shall comply with Section 707.4.

706.3.2 Exit enclosures. The fire-resistance rating of the fire barrier separating building areas from an exit shall comply with Section 1020.1.

706.3.3 Exit passageway. The fire-resistance rating of the separation between building areas and an exit passageway shall comply with Section 1021.1.

706.3.4 Horizontal exit. The fire-resistance rating of the separation between building areas connected by a horizontal exit shall comply with Section 1022.1.

706.3.5 Atriums. The fire-resistance rating of the fire barrier separating atriums shall comply with Section 404.5.

706.3.6 Incidental use areas. The fire barrier separating incidental use areas shall have a fire-resistance rating of not less than that indicated in Table 508.2.

706.3.7 Control areas. Fire barriers separating control areas shall have a fire-resistance rating of not less than that required in Section 414.2.4.

706.3.8 Separation of mixed occupancies. Where the provisions of Section 508.3.3 are applicable, the fire barrier separating mixed occupancies shall have a fire-resistance rating of not less than that indicated in Section 508.3.3 based on the occupancies being separated.

706.3.9 Single-occupancy fire areas. The fire barrier or horizontal assembly, or both, separating a single occupancy into different fire areas shall have a fire-resistance rating of not less than that indicated in Table 706.3.9.

**TABLE 706.3.9
FIRE-RESISTANCE RATING REQUIREMENTS FOR FIRE
BARRIER ASSEMBLIES BETWEEN FIRE AREAS**

OCCUPANCY GROUP	FIRE-RESISTANCE RATING (hours)
H-1, H-2	4
F-1, H-3, S-1	3
A, B, D, E, F-2, F-3, H-4, H-5, I, M, R, S-2	2
U	1

706.4 Exterior walls. Where exterior walls serve as a part of a required fire-resistance-rated shaft or exit enclosure, such walls shall comply with the requirements of Section 704 for exterior walls and the fire-resistance-rated enclosure requirements shall not apply.

Exception: Exterior walls required to be fire-resistance rated in accordance with Section 1023.6.

706.5 Continuity. Fire barriers shall extend from the top of the floor/ceiling assembly below to the underside of the floor or roof slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed

spaces, such as the space above a suspended ceiling. The supporting construction for fire barriers shall be protected to afford the required fire-resistance rating of the fire barrier supported, except for 1-hour fire-resistance-rated incidental use area separations as required by Table 508.2 in buildings of Type IIB, IIIB and VB construction. Hollow vertical spaces within a fire barrier shall be fireblocked in accordance with Section 717.2 at every floor level.

Exceptions:

1. The maximum required fire-resistance rating for assemblies supporting fire barriers separating tank storage as provided for in Section 415.6.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 707.12.

706.6 Exterior walls. Where exterior walls serve as a part of a required fire-resistance-rated enclosure or separation, such walls shall comply with the requirements of Section 704 for exterior walls, and the fire-resistance-rated enclosure or separation requirements shall not apply.

Exception: Exterior walls required to be fire-resistance rated in accordance with Section 1014.5.1 for exterior egress balconies, Section 1020.1.4 for exit enclosures and Section 1023.6 for exterior exit ramps and stairways.

706.7 Openings. Openings in a fire barrier wall shall be protected in accordance with Section 715. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and a maximum area of any single opening shall not exceed 156 square feet (15 m²). Openings in exit enclosures and exit passageways shall also comply with Sections 1020.1.1 and 1021.4, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m²) where adjoining fire areas are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Fire doors serving an exit enclosure.
3. Openings shall not be limited to 156 square feet (15 m²) or an aggregate width of 25 percent of the length of the wall where the opening protective assembly has been tested in accordance with ASTM E 119 and has a minimum fire-resistance rating not less than the fire-resistance rating of the wall.
4. Fire windows permitted in atrium separation walls shall not be limited to a maximum aggregate width of 25 percent of length of the wall.

706.8 Penetrations. Penetrations of fire barriers shall comply with Section 712.

706.8.1 Prohibited penetrations. Penetrations into an exit enclosure or an exit passageway shall be allowed only when permitted by Section 1020.1.2 or 1021.5, respectively.

706.9 Joints. Joints made in or between fire barriers shall comply with Section 713.

706.10 Ducts and air transfer openings. Penetrations in a fire barrier by ducts and air transfer openings shall comply with Section 716.

SECTION 707 SHAFT ENCLOSURES

707.1 General. The provisions of this section shall apply to vertical shafts where such shafts are required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies. Shaft enclosures shall be constructed as fire barriers in accordance with Section 706 or horizontal assemblies in accordance with Section 711, or both.

707.2 Shaft enclosure required. Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this Section.

Exceptions:

1. A shaft enclosure is not required for openings totally within an individual residential dwelling unit and connecting four stories or less.
2. A shaft enclosure is not required in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 for an escalator opening or stairway that is not a portion of the means of egress protected according to Item 2.1 or 2.2:
 - 2.1. Where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.
 - 2.2. Where the opening is protected by approved power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.11 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release therefrom.
3. A shaft enclosure is not required for penetrations by pipe, tube, conduit, wire, cable and vents protected in accordance with Section 712.4.
4. A shaft enclosure is not required for penetrations by ducts protected in accordance with Section 712.4.

Grease ducts shall be protected in accordance with the *Florida Building Code, Mechanical*. ||

5. In other than Group H occupancies, a shaft enclosure is not required for floor openings complying with the provisions for atriums in Section 404.
6. A shaft enclosure is not required for approved masonry chimneys where annular space protection is provided at each floor level in accordance with Section 717.2.5.
7. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following:
 - 7.1. Does not connect more than two stories.
 - 7.2. Is not part of the required means of egress system, except as permitted in Section 1020.1.
 - 7.3. Is not concealed within the building construction.
 - 7.4. Is not open to a corridor in Group I and R occupancies.
 - 7.5. Is not open to a corridor on nonsprinklered floors in any occupancy.
 - 7.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.
 - 7.7. Is limited to the same smoke compartment.
8. A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively.
9. A shaft enclosure is not required for floor openings between a mezzanine and the floor below.
10. A shaft enclosure is not required for joints protected by a fire-resistant joint system in accordance with Section 713.
11. A shaft enclosure shall not be required for floor openings created by unenclosed stairs or ramps in accordance with Exception 8 or 9 in Section 1020.1.
12. Floor openings protected by floor fire door assemblies in accordance with Section 711.8.
13. Where permitted by other sections of this code.

707.3 Materials. The shaft enclosure shall be of materials permitted by the building type of construction.

707.4 Fire-resistance rating. Shaft enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more, and not less than 1 hour where connecting less than four stories. The number of stories connected by the shaft enclosure shall include any basements but not any mezzanines. Shaft enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours.

707.5 Continuity. Shaft enclosures shall be constructed as fire barriers in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both, and

shall have continuity in accordance with Section 706.5 for fire barriers or Section 711.4 for horizontal assemblies as applicable.

707.6 Exterior walls. Where exterior walls serve as a part of a required shaft enclosure, such walls shall comply with the requirements of Section 704 for exterior walls and the fire-resistance-rated enclosure requirements shall not apply.

Exception: Exterior walls required to be fire-resistance rated in accordance with Section 1014.5.1 for exterior egress balconies, Section 1020.1.4 for exit enclosures and Section 1023.6 for exterior exit ramps and stairways.

707.7 Openings. Openings in a shaft enclosure shall be protected in accordance with Section 715 as required for fire barriers. Doors shall be self- or automatic closing by smoke detection in accordance with Section 715.4.7.3.

707.7.1 Prohibited openings. Openings other than those necessary for the purpose of the shaft shall not be permitted in shaft enclosures.

707.8 Penetrations. Penetrations in a shaft enclosure shall be protected in accordance with Section 712 as required for fire barriers.

707.8.1 Prohibited penetrations. Penetrations other than those necessary for the purpose of the shaft shall not be permitted in shaft enclosures.

707.9 Joints. Joints in a shaft enclosure shall comply with Section 713.

707.10 Ducts and air transfer openings. Penetrations of a shaft enclosure by ducts and air transfer openings shall comply with Section 716.

707.11 Enclosure at the bottom. Shafts that do not extend to the bottom of the building or structure shall:

1. Be enclosed at the lowest level with construction of the same fire-resistance rating as the lowest floor through which the shaft passes, but not less than the rating required for the shaft enclosure;
2. Terminate in a room having a use related to the purpose of the shaft. The room shall be separated from the remainder of the building by a fire barrier having a fire-resistance rating and opening protectives at least equal to the protection required for the shaft enclosure; or
3. Be protected by approved fire dampers installed in accordance with their listing at the lowest floor level within the shaft enclosure.

Exceptions:

1. The fire-resistance-rated room separation is not required, provided there are no openings in or penetrations of the shaft enclosure to the interior of the building except at the bottom. The bottom of the shaft shall be closed off around the penetrating items with materials permitted by Section 717.3.1 for draftstopping, or the room shall be provided with an approved automatic fire suppression system.

2. A shaft enclosure containing a refuse chute or laundry chute shall not be used for any other purpose and shall terminate in a room protected in accordance with Section 707.13.4.
3. The fire-resistance-rated room separation and the protection at the bottom of the shaft are not required, provided there are no combustibles in the shaft and there are no openings or other penetrations through the shaft enclosure to the interior of the building.

707.12 Enclosure at the top. A shaft enclosure that does not extend to the underside of the roof sheathing, deck or slab of the building shall be enclosed at the top with construction of the same fire-resistance rating as the topmost floor penetrated by the shaft, but not less than the fire-resistance rating required for the shaft enclosure.

707.13 Refuse and laundry chutes. Refuse and laundry chutes, access and termination rooms and incinerator rooms shall meet the requirements of Sections 707.13.1 through 707.13.6.

Exception: Chutes serving and contained within a single dwelling unit.

707.13.1 Refuse and laundry chute enclosures. A shaft enclosure containing a refuse or laundry chute shall not be used for any other purpose and shall be enclosed in accordance with Section 707.4. Openings into the shaft, including those from access rooms and termination rooms, shall be protected in accordance with this section and Section 715. Openings into chutes shall not be located in corridors. Doors shall be self- or automatic closing upon the actuation of a smoke detector in accordance with Section 715.4.7.3, except that heat-activated closing devices shall be permitted between the shaft and the termination room.

707.13.2 Materials. A shaft enclosure containing a refuse or laundry chute shall be constructed of materials as permitted by the building type of construction.

707.13.3 Refuse and laundry chute access rooms. Access openings for refuse and laundry chutes shall be located in rooms or compartments enclosed by a fire barrier that has a fire-resistance rating of not less than 1 hour. Openings into the access rooms shall be protected by opening protectives having a fire protection rating of not less than $3/4$ hour. Doors shall be self- or automatic closing upon the detection of smoke in accordance with Section 715.4.7.3.

707.13.4 Termination room. Refuse and laundry chutes shall discharge into an enclosed room separated from the remainder of the building by a fire barrier that has a fire-resistance rating of not less than 1 hour. Openings into the termination room shall be protected by opening protectives having a fire protection rating of not less than $3/4$ hour. Doors shall be self- or automatic closing upon the detection of smoke in accordance with Section 715.4.7.3. Refuse chutes shall not terminate in an incinerator room. Refuse and laundry rooms that are not provided with chutes need only comply with Table 508.2.

707.13.5 Incinerator room. Incinerator rooms shall comply with Table 508.2.

707.13.6 Automatic sprinkler system. An approved automatic sprinkler system shall be installed in accordance with Section 903.2.10.2.

707.14 Elevator, dumbwaiter and other hoistways. Elevator, dumbwaiter and other hoistway enclosures shall be constructed in accordance with Section 707 and Chapter 30.

707.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions equal to the fire-resistance rating of the corridor and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. In other than Group I-3, and buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 707.14.2.

707.14.2 Enclosed elevator lobby pressurization alternative. Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with this section.

707.14.2.1 Pressurization requirements. Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.04 inches of water column (1.0 Pa) and a maximum positive pressure of 0.06 inches of water column (1.49 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all ground floor level hoistway doors open and all other hoistway doors closed. The supply air intake shall be from an outside, uncon-

taminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

707.14.2.2 Ducts for system. Any duct system that is part of the pressurization system shall be protected with the same fire-resistance rating as required for the elevator shaft enclosure.

707.14.2.3 Fan system. The fan system provided for the pressurization system shall be as required by this section.

707.14.2.3.1 Fire resistance. When located within the building, the fan system that provides the pressurization shall be protected with the same fire-resistance rating required for the elevator shaft enclosure.

707.14.2.3.2 Smoke detection. The fan system shall be equipped with a smoke detector that will automatically shut down the fan system when smoke is detected within the system.

707.14.2.3.3 Separate systems. A separate fan system shall be used for each bank of elevators.

707.14.2.3.4 Fan capacity. The supply fan shall either be adjustable with a capacity of at least 1,000 cfm (.4719 m³/s) per door, or that specified by a registered design professional to meet the requirements of a designed pressurization system.

707.14.2.4 Standby power. The pressurization system shall be provided with standby power from the same source as other required emergency systems for the building.

707.14.2.5 Activation of pressurization system. The elevator pressurization system shall be activated upon activation of the building fire alarm system or upon activation of the elevator lobby smoke detectors.

**SECTION 708
FIRE PARTITIONS**

708.1 General. The following wall assemblies shall comply with this section:

1. Walls separating dwelling units in the same building.
2. Walls separating sleeping units in occupancies in Group R-1 hotel, R-2 and I-1 occupancies.
3. Walls separating tenant spaces in covered mall buildings as required by Section 402.7.2.
4. Corridor walls as required by Section 1016.1.
5. Elevator lobby separation as required by Section 707.14.1.
6. Residential aircraft hangars.
7. Wall separating individual tenant spaces.

Exceptions:

1. In Group B and S occupancies, walls used to separate tenants shall not be required to have a fire-resistance rating, provided no area between fire partitions having a 1-hour fire-resistance rating exceeds 3,000 square feet (279 m²).

2. In aircraft hangar occupancies, walls used to separate tenants shall not be required to have a fire-resistance rating, provided the aircraft hanger is constructed in accordance with the requirements of Section 412.2.
3. In mini-warehouses/self-storage buildings, walls used to separate tenants shall not be required to have fire-resistance rating, provided a sprinkler system meeting the requirements of Ordinary Hazard Group II as defined by NFPA 13, is installed employing quick response heads.

708.2 Materials. The walls shall be of materials permitted by the building type of construction.

708.3 Fire-resistance rating. Fire partitions shall have a fire-resistance rating of not less than 1 hour.

Exceptions:

1. Corridor walls as permitted by Table 1017.1.
2. Dwelling and sleeping unit separations in buildings of Type IIB, IIIB and VB construction shall have fire-resistance ratings of not less than 1/2 hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

708.4 Continuity. Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above or to the fire-resistance-rated floor/ceiling or roof/ceiling assembly above, and shall be securely attached thereto. If the partitions are not continuous to the sheathing, deck or slab, and where constructed of combustible construction, the space between the ceiling and the sheathing, deck or slab above shall be fireblocked or draftstopped in accordance with Sections 717.2 and 717.3 at the partition line. The supporting construction shall be protected to afford the required fire-resistance rating of the wall supported, except for tenant and sleeping unit separation walls and corridor walls in buildings of Types IIB, IIIB and VB construction.

Exceptions:

1. The wall need not be extended into the crawl space below where the floor above the crawl space has a minimum 1-hour fire-resistance rating.
2. Where the room-side fire-resistance-rated membrane of the corridor is carried through to the underside of the floor or roof sheathing, deck or slab of a fire-resistance-rated floor or roof above, the ceiling of the corridor shall be permitted to be protected by the use of ceiling materials as required for a 1-hour fire-resistance-rated floor or roof system.
3. Where the corridor ceiling is constructed as required for the corridor walls, the walls shall be permitted to terminate at the upper membrane of such ceiling assembly.
4. The fire partition separating tenant spaces in a mall, complying with Section 402.7.2, are not required to extend beyond the underside of a ceiling that is not part of a fire-resistance-rated assembly. A wall is not

required in attic or ceiling spaces above tenant separation walls.

5. Fireblocking or draftstopping is not required at the partition line in Group R-2 buildings that do not exceed four stories in height, provided the attic space is subdivided by draftstopping into areas not exceeding 3,000 square feet (279 m²) or above every two dwelling units, whichever is smaller.
6. Fireblocking or draftstopping is not required at the partition line in buildings equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, provided that automatic sprinklers are installed in combustible floor/ceiling and roof/ceiling spaces.

708.4.1 Roof Construction. When the fire partition is continuous to the underside of the roof sheathing in occupancies of Groups R-1, R-2 and R-3 as applicable in Section 101.2, in Type III, IV and V construction the following shall be provided:

708.4.1.1 Roof Sheathing. The roof sheathing or deck shall be of approved noncombustible materials or of fire-retardant-treated wood, for a distance of 4 feet (1220 mm); or

708.4.1.2 Roof Protection. The roof shall be protected with 0.625-inch (15.88 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members, for a minimum distance of 4 feet (1220 mm).

708.5 Exterior walls. Where exterior walls serve as a part of a required fire-resistance-rated separation, such walls shall comply with the requirements of Section 704 for exterior walls, and the fire-resistance-rated separation requirements shall not apply.

Exception: Exterior walls required to be fire-resistance rated in accordance with Section 1014.5.1 for exterior egress balconies, Section 1020.1.4 for exit enclosures and Section 1023.6 for exterior exit ramps and stairways.

708.6 Openings. Openings in a fire partition shall be protected in accordance with Section 715.

708.7 Penetrations. Penetrations of fire partitions shall comply with Section 712.

708.8 Joints. Joints made in or between fire partitions shall comply with Section 713.

708.9 Ducts and air transfer openings. Penetrations in a fire partition by ducts and air transfer openings shall comply with Section 716.

SECTION 709 SMOKE BARRIERS

709.1 General. Smoke barriers shall comply with this section.

709.2 Materials. Smoke barriers shall be of materials permitted by the building type of construction.

709.3 Fire-resistance rating. A 1-hour fire-resistance rating is required for smoke barriers.

Exception: Smoke barriers constructed of minimum 0.10-inch-thick (2.5 mm) steel in Group I-3 buildings.

709.4 Continuity. Smoke barriers shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required fire-resistance rating of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

Exception: Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.

709.5 Openings. Openings in a smoke barrier shall be protected in accordance with Section 715.

Exception: In Group I-2, where doors are installed across corridors, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested. The doors shall be close fitting within operational tolerances, and shall not have undercuts, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic closing by smoke detection in accordance with Section 715.4.7.3. Positive-latching devices are not required.

709.6 Penetrations. Penetrations of smoke barriers shall comply with Section 712.

709.7 Joints. Joints made in or between smoke barriers shall comply with Section 713.

709.8 Ducts and air transfer openings. Penetrations in a smoke barrier by ducts and air transfer openings shall comply with Section 716.

SECTION 710 SMOKE PARTITIONS

710.1 General. Smoke partitions installed as required elsewhere in the code shall comply with this section.

710.2 Materials. The walls shall be of materials permitted by the building type of construction.

710.3 Fire-resistance rating. Unless required elsewhere in the code, smoke partitions are not required to have a fire-resistance rating.

710.4 Continuity. Smoke partitions shall extend from the top of the foundation or floor below to the underside of the floor or roof sheathing, deck or slab above or to the underside of the ceiling above where the ceiling membrane is constructed to limit the transfer of smoke.

710.5 Openings. Windows shall be sealed to resist the free passage of smoke or be automatic-closing upon detection of smoke. Doors in smoke partitions shall comply with this section.

710.5.1 Louvers. Doors in smoke partitions shall not include louvers.

710.5.2 Smoke and draft control doors. Where required elsewhere in the code, doors in smoke partitions shall be tested in accordance with UL 1784 with an artificial bottom seal installed across the full width of the bottom of the door assembly during the test. The air leakage rate of the door assembly shall not exceed 3 cubic feet per minute per square foot [$\text{ft}^3/(\text{min} \cdot \text{ft}^2)$]($0.015424 \text{ m}^3/\text{s} \cdot \text{m}^2$) of door opening at 0.10 inch (24.9Pa) of water for both the ambient temperature test and the elevated temperature exposure test.

710.5.3 Self- or automatic-closing doors. Where required elsewhere in the code, doors in smoke partitions shall be self- or automatic closing by smoke detection in accordance with Section 715.4.7.3.

710.6 Penetrations and joints. The space around penetrating items and in joints shall be filled with an approved material to limit the free passage of smoke.

710.7 Ducts and air transfer openings. The space around a duct penetrating a smoke partition shall be filled with an approved material to limit the free passage of smoke. Air transfer openings in smoke partitions shall be provided with a smoke damper complying with Section 716.3.2.

Exception: Where the installation of a smoke damper will interfere with the operation of a required smoke control system in accordance with Section 909, approved alternative protection shall be utilized.

SECTION 711 HORIZONTAL ASSEMBLIES

711.1 General. Floor and roof assemblies required to have a fire-resistance rating shall comply with this section.

711.2 Materials. The floor and roof assemblies shall be of materials permitted by the building type of construction.

711.3 Fire-resistance rating. The fire-resistance rating of floor and roof assemblies shall not be less than that required by the building type of construction. Where the floor assembly separates mixed occupancies, the assembly shall have a fire-resistance rating of not less than that required by Section 508.3.3 based on the occupancies being separated. Where the floor assembly separates a single occupancy into different fire areas, the assembly shall have a fire-resistance rating of not less than that required by Section 706.3.9. Floor assemblies separating dwelling units in the same building or sleeping units in occupancies in Group R-1, hotel occupancies, R-2 and I-1; and floor assemblies separating individual tenant spaces in the same building in all other occupancies shall be a minimum of 1-hour fire-resistance-rated construction.

Exceptions:

1. Dwelling unit and sleeping unit separations in buildings of Type IIB, IIIB, and VB construction shall have fire-resistance ratings of not less than ½ hour in build-

ings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

2. Individual tenant space separations in buildings of Type IIB, IIIB and VB construction in covered mall buildings are not required to have a fire-resistance rating.

711.3.1 Ceiling panels. Where the weight of lay-in ceiling panels, used as part of fire-resistance-rated floor/ceiling or roof/ceiling assemblies, is not adequate to resist an upward force of 1 lb/ft.² (48 Pa), wire or other approved devices shall be installed above the panels to prevent vertical displacement under such upward force.

711.3.2 Access doors. Access doors shall be permitted in ceilings of fire-resistance-rated floor/ceiling and roof/ceiling assemblies provided such doors are tested in accordance with ASTM E 119 as horizontal assemblies and labeled by an approved agency for such purpose.

711.3.3 Unusable space. In 1-hour fire-resistance-rated floor construction, the ceiling membrane is not required to be installed over unusable crawl spaces. In 1-hour fire-resistance-rated roof construction, the floor membrane is not required to be installed where unusable attic space occurs above.

711.4 Continuity. Assemblies shall be continuous without openings, penetrations or joints except as permitted by this section and Sections 707.2, 712.4, 713 and 1020.1. Skylights and other penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof construction is maintained. Unprotected skylights shall not be permitted in roof construction required to be fire-resistance rated in accordance with Section 704.10. The supporting construction shall be protected to afford the required fire-resistance rating of the horizontal assembly supported.

711.5 Penetrations. Penetrations of fire-resistance-rated horizontal assemblies shall comply with Section 712.

711.6 Joints. Joints made in or between fire-resistance-rated horizontal assemblies shall comply with Section 713. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 713.4.

711.7 Ducts and air transfer openings. Penetrations in horizontal assemblies by ducts and air transfer openings shall comply with Section 716.

711.8 Floor fire door assemblies. Floor fire door assemblies used to protect openings in fire-resistance-rated floors shall be tested in accordance with NFPA 288, and shall achieve a fire-resistance rating not less than the assembly being penetrated. Floor fire door assemblies shall be labeled by an approved agency. The label shall be permanently affixed and shall specify the manufacturer, the test standard and the fire-resistance rating.

SECTION 712 PENETRATIONS

712.1 Scope. The provisions of this section shall govern the materials and methods of construction used to protect through penetrations and membrane penetrations of horizontal assemblies and fire-resistance-rated wall assemblies.

712.2 Installation details. Where sleeves are used, they shall be securely fastened to the assembly penetrated. The space between the item contained in the sleeve and the sleeve itself and any space between the sleeve and the assembly penetrated shall be protected in accordance with this section. Insulation and coverings on or in the penetrating item shall not penetrate the assembly unless the specific material used has been tested as part of the assembly in accordance with this section.

712.3 Fire-resistance-rated walls. Penetrations into or through fire walls, fire-barrier walls, smoke-barrier walls and fire partitions shall comply with Sections 712.3.1 through 712.3.4.

712.3.1 Through penetrations. Through penetrations of fire-resistance-rated walls shall comply with Section 712.3.1.1 or 712.3.1.2.

Exception: Where the penetrating items are steel, ferrous or copper pipes, tubes or conduits, the annular space between the penetrating item and the fire-resistance-rated wall is permitted to be protected as follows:

1. In concrete or masonry walls where the penetrating item is a maximum 6-inch (152 mm) nominal diameter and the area of the opening through the wall does not exceed 144 square inches (0.0929 m²), concrete, grout or mortar is permitted where it is installed the full thickness of the wall or the thickness required to maintain the fire-resistance rating; or
2. The material used to fill the annular space shall prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E 119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.

712.3.1.1 Fire-resistance-rated assemblies. Penetrations shall be installed as tested in an approved fire-resistance-rated assembly.

712.3.1.2 Through-penetration firestop system. Through penetrations shall be protected by an approved penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water and shall have an F rating of not less than the required fire-resistance rating of the wall penetrated.

712.3.2 Membrane penetrations. Membrane penetrations shall comply with Section 712.3.1. Where walls or partitions are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

Exceptions:

1. Membrane penetrations of maximum two-hour fire-resistance-rated walls and partitions by steel electrical boxes that do not exceed 16 square inches (0.0103 m²) in area, provided the aggregate area of the openings through the membrane does not exceed 100 square inches (0.0645 m²) in any 100 square feet (9.29 m²) of wall area. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm). Such boxes on opposite sides of the wall or partition shall be separated by one of the following:
 - 1.1. By a horizontal distance of not less than 24 inches (610 mm);
 - 1.2. By a horizontal distance of not less than the depth of the wall cavity where the wall cavity is filled with cellulose loose-fill, rockwool or slag mineral wool insulation;
 - 1.3. By solid fireblocking in accordance with Section 717.2.1;
 - 1.4. By protecting both boxes with listed putty pads; or
 - 1.5. By other listed materials and methods.
2. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise. Such boxes on opposite sides of the wall or partition shall be separated as follows:
 - 2.1. By a horizontal distance of not less than 24 inches (610 mm);
 - 2.2. By solid fireblocking in accordance with Section 717.2.1;
 - 2.3. By protecting both boxes with listed putty pads; or
 - 2.4. By other listed materials and methods.
3. The annular space created by the penetration of an automatic sprinkler, provided it is covered by a metal escutcheon plate.

712.3.3 Ducts and air transfer openings. Penetrations of fire-resistance-rated walls by ducts that are not protected with dampers shall comply with Sections 712.2 through 712.3.1. Ducts and air transfer openings that are protected with dampers shall comply with Section 716.

712.3.4 Dissimilar materials. Noncombustible penetrating items shall not connect to combustible items beyond the point of firestopping unless it can be demonstrated that the fire-resistance integrity of the wall is maintained.

712.4 Horizontal assemblies. Penetrations of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall be protected in accordance with Section 707.

712.4.1 Fire-resistance rated assemblies. Penetrations of the fire-resistance rated floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall comply with Sections 712.4.1.1 through 712.4.1.4.

712.4.1.1 Through penetrations. Through penetrations of fire-resistance-rated horizontal assemblies shall comply with Section 712.4.1.1.1 or 712.4.1.1.2.

Exceptions:

1. Penetrations by steel, ferrous or copper conduits, pipes, tubes or vents or concrete or masonry items through a single fire-resistance-rated floor assembly where the annular space is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E 119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated. Penetrating items with a maximum 6-inch (152 mm) nominal diameter shall not be limited to the penetration of a single fire-resistance-rated floor assembly, provided the aggregate area of the openings through the assembly does not exceed 144 square inches (92 900 mm²) in any 100 square feet (9.3 m²) of floor area.
2. Penetrations in a single concrete floor by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch (152 mm) nominal diameter, provided the concrete, grout or mortar is installed the full thickness of the floor or the thickness required to maintain the fire-resistance rating. The penetrating items shall not be limited to the penetration of a single concrete floor, provided the area of the opening through each floor does not exceed 144 square inches (92 900 mm²).
3. Penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and installed in accordance with the instructions included in the listing.

712.4.1.1.1 Installation. Through penetrations shall be installed as tested in the approved fire-resistance-rated assembly.

712.4.1.1.2 Through-penetration firestop system. Through penetrations shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an F-rating and a T-rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Exception: Floor penetrations contained and located within the cavity of a wall do not require a T- rating.

712.4.1.2 Membrane penetrations. Penetrations of membranes that are part of a fire-resistance-rated horizontal assembly shall comply with Section 712.4.1.1.1 or 712.4.1.1.2. Where floor/ceiling assemblies are required to have a minimum 1-hour fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

Exceptions:

1. Membrane penetrations by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the annular space is protected either in accordance with Section 712.4.1.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm²) in any 100 square feet (9.3 m²) of ceiling area in assemblies tested without penetrations.
2. Ceiling membrane penetrations of maximum 2-hour fire-resistance-rated horizontal assemblies by steel electrical boxes that do not exceed 16 square inches (10 323 mm²) in area, provided the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm²) in any 100 square feet (9.29 m²) of ceiling area, and the annular space between the ceiling membrane and the box does not exceed 1/8 inch (3.12 mm).
3. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the ceiling membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise.
4. The annular space created by the penetration of a fire sprinkler, provided it is covered by a metal eschutcheon plate.

712.4.1.3 Ducts and air transfer openings. Penetrations of horizontal assemblies by ducts and air transfer openings shall comply with Section 716.

712.4.1.4 Dissimilar materials. Noncombustible penetrating items shall not connect to combustible materials beyond the point of firestopping unless it can be demonstrated that the fire-resistance integrity of the horizontal assembly is maintained.

712.4.2 Nonfire-resistance-rated assemblies. Penetrations of horizontal assemblies without a required fire-resistance rating shall meet the requirements of Section 707 or shall comply with Section 712.4.2.1 or 712.4.2.2.

712.4.2.1 Noncombustible penetrating items. Noncombustible penetrating items that connect not more

than three stories are permitted, provided that the annular space is filled with an approved noncombustible material to resist the free passage of flame and the products of combustion.

712.4.2.2 Penetrating items. Penetrating items that connect not more than two stories are permitted, provided that the annular space is filled with an approved material to resist the free passage of flame and the products of combustion.

712.5 Penetrations in smoke barriers. Penetrations in smoke barriers shall be tested in accordance with the requirements of UL 1479 for air leakage. The air leakage rate of the penetration assembly shall not exceed 5.0 cfm per square foot (0.025 m³ / s · m²) of penetration opening at 0.30 inch (7.47 Pa) of water for both the ambient temperature and elevated temperature tests.

712.6 Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings shall be effectively and permanently identified with signs or stenciling in a manner acceptable to the Authority having Jurisdiction. Such identification shall be above any decorative ceiling and in concealed spaces. Suggested wording for fire and smoke barriers: "FIRE AND SMOKE BARRIER – PROTECT ALL OPENINGS."

SECTION 713 FIRE-RESISTANT JOINT SYSTEMS

713.1 General. Joints installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved fire-resistant joint system designed to resist the passage of fire for a time period not less than the required fire-resistance rating of the wall, floor or roof in or between which it is installed. Fire-resistant joint systems shall be tested in accordance with Section 713.3. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 713.4.

Exception: Fire-resistant joint systems shall not be required for joints in all of the following locations:

1. Floors within a single dwelling unit.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 707.
3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within malls.
5. Floors within open parking structures.
6. Mezzanine floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E 119.

713.2 Installation. Fire-resistant joint systems shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases.

713.3 Fire test criteria. Fire-resistant joint systems shall be tested in accordance with the requirements of either ASTM E 1966 or UL 2079. Nonsymmetrical wall joint systems shall be tested with both faces exposed to the furnace, and the assigned fire-resistance rating shall be the shortest duration obtained from the two tests. When evidence is furnished to show that the wall was tested with the least fire-resistant side exposed to the furnace, subject to acceptance of the building official, the wall need not be subjected to tests from the opposite side.

Exception: For exterior walls with a horizontal fire separation distance greater than 5 feet (1524 mm), the joint system shall be required to be tested for interior fire exposure only.

713.4 Exterior curtain wall/floor intersection. Where fire resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with an approved material or system to prevent the interior vertical spread of fire. Such material or systems shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected either to ASTM E 119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch of water column (2.5 Pa) or installed as tested in accordance with ASTM E 2307 for the time period at least equal to the fire-resistance rating of the floor assembly. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 704.9.

713.5 Spandrel wall. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 704.9. Where Section 704.9 does not require a fire-resistance-rated spandrel wall, the requirements of Section 713.4 shall still apply to the intersection between the spandrel wall and the floor.

713.6 Fire-resistant joint systems in smoke barriers. Fire-resistant joint systems in smoke barriers shall be tested in accordance with the requirements of UL 2079 for air leakage. The air leakage rate of the joint shall not exceed 5 cfm per lineal foot (0.00775 m³/s · m) of joint at 0.30 inch (7.47 Pa) of water for both the ambient temperature and elevated temperature tests.

SECTION 714 FIRE-RESISTANCE RATING OF STRUCTURAL MEMBERS

714.1 Requirements. The fire-resistance rating of structural members and assemblies shall comply with the requirements for the type of construction and shall not be less than the rating required for the fire-resistance-rated assemblies supported.

Exception: Fire barriers, fire partitions and smoke barriers as provided in Sections 706.5, 708.4 and 709.4, respectively.

714.2 Protection of structural members. Protection of columns, girders, trusses, beams, lintels or other structural members that are required to have a fire-resistance rating shall comply with this section.

714.2.1 Individual protection. Columns, girders, trusses, beams, lintels or other structural members that are required to have a fire-resistance rating and that support more than two floors or one floor and roof, or support a load-bearing wall or a nonload-bearing wall more than two stories high, shall be individually protected on all sides for the full length with materials having the required fire-resistance rating. Other structural members required to have a fire-resistance rating shall be protected by individual encasement, by a membrane or ceiling protection as specified in Section 711, or by a combination of both. Columns shall also comply with Section 714.2.2.

714.2.1.1 Membrane protection. King studs and boundary elements that are integral elements in load-bearing walls of light-framed construction shall be permitted to have required fire-resistance ratings provided by the membrane protection provided for the load-bearing wall.

714.2.2 Column protection above ceilings. Where columns require a fire-resistance rating, the entire column, including its connections to beams or girders, shall be protected. Where the column extends through a ceiling, fire resistance of the column shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.

714.2.3 Truss protection. The required thickness and construction of fire-resistance-rated assemblies enclosing trusses shall be based on the results of full-scale tests or combinations of tests on truss components or on approved calculations based on such tests that satisfactorily demonstrate that the assembly has the required fire resistance.

714.2.4 Attachments to structural members. The edges of lugs, brackets, rivets and bolt heads attached to structural members shall be permitted to extend to within 1 inch (25 mm) of the surface of the fire protection.

714.2.5 Reinforcing. Thickness of protection for concrete or masonry reinforcement shall be measured to the outside of the reinforcement except that stirrups and spiral reinforcement ties are permitted to project not more than 0.5-inch (12.7 mm) into the protection.

714.3 Embedments and enclosures. Pipes, wires, conduits, ducts or other service facilities shall not be embedded in the required fire protective covering of a structural member that is required to be individually encased.

714.4 Impact protection. Where the fire protective covering of a structural member is subject to impact damage from moving vehicles, the handling of merchandise or other activity, the fire protective covering shall be protected by corner guards or by a substantial jacket of metal or other noncombustible material to a height adequate to provide full protection, but not less than 5 feet (1524 mm) from the finished floor.

714.5 Exterior structural members. Load-bearing structural members located within the exterior walls or on the outside of a

building or structure shall be provided with the highest fire-resistance rating as determined in accordance with the following:

1. As required by Table 601 for the type of building element based on the type of construction of the building;
2. As required by Table 601 for exterior bearing walls based on the type of construction; and
3. As required by Table 602 for exterior walls based on the fire separation distance.

714.6 Bottom flange protection. Fire protection is not required at the bottom flange of lintels, shelf angles and plates, spanning not more than 6 feet (1829 mm) whether part of the structural frame or not, and from the bottom flange of lintels, shelf angles and plates not part of the structural frame, regardless of span.

714.7 Seismic isolation systems. Reserved.

**SECTION 715
OPENING PROTECTIVES**

715.1 General. Opening protectives required by other sections of this code shall comply with the provisions of this section.

715.2 Fire-resistance-rated glazing. Labeled fire-resistance-rated glazing tested as part of a fire-resistance-rated wall assembly in accordance with ASTM E 119 shall not be required to comply with this section.

715.3 Alternative methods for determining fire protection ratings. The application of any of the alternative methods listed in this section shall be based on the fire exposure and acceptance criteria specified in NFPA 252 or NFPA 257. The required fire resistance of an opening protective shall be per-

mitted to be established by any of the following methods or procedures:

1. Designs documented in approved sources.
2. Calculations performed in an approved manner.
3. Engineering analysis based on a comparison of opening protective designs having fire-protection ratings as determined by the test procedures set forth in NFPA 252 or NFPA 257.
4. Alternative protection methods as allowed by Section 104.11.

715.4 Fire door and shutter assemblies. Approved fire door and fire shutter assemblies shall be constructed of any material or assembly of component materials that conforms to the test requirements of Section 715.4.1, 715.4.2 or 715.4.3 and the fire-protection rating indicated in Table 715.4. Fire door assemblies and shutters shall be installed in accordance with the provisions of this section and NFPA 80.

Exceptions:

1. Labeled protective assemblies that conform to the requirements of this section or UL 10A, UL 14B and UL 14C for tin-clad fire door assemblies.
2. Floor fire door assemblies in accordance with Section 711.8.

715.4.1 Side-hinged or pivoted swinging doors. Side-hinged and pivoted swinging doors shall be tested in accordance with NFPA 252 or UL 10C. After 5 minutes into the NFPA 252 test, the neutral pressure level in the furnace shall be established at 40 inches (1016 mm) or less above the sill.

**TABLE 715.4
FIRE DOOR AND FIRE SHUTTER FIRE PROTECTION RATINGS**

TYPE OF ASSEMBLY	REQUIRED ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4	3
	3	3 ^a
	2	1½
	1½	1½
Fire barriers having a required fire-resistance rating of 1 hour: Shaft, exit enclosure and exit passageway walls Other fire barriers	1	1
	1	¾
Fire partitions: Corridor walls Other fire partitions	1	⅓ ^b
	0.5	⅓ ^b
	1	¾
	0.5	⅓
Exterior walls	3	1½
	2	1½
	1	¾
Smoke barriers	1	⅓ ^b

a. Two doors, each with a fire protection rating of 1½ hours, installed on opposite sides of the same opening in a fire wall, shall be deemed equivalent in fire protection rating to one 3-hour fire door.
b. For testing requirements, see Section 715.4.3.

715.4.2 Other types of doors. Other types of doors, including swinging elevator doors, shall be tested in accordance with NFPA 252 or UL 10B. The pressure in the furnace shall be maintained as nearly equal to the atmospheric pressure as possible. Once established, the pressure shall be maintained during the entire test period.

715.4.3 Door assemblies in corridors and smoke barriers. Fire door assemblies required to have a minimum fire protection rating of 20 minutes where located in corridor walls or smoke-barrier walls having a fire-resistance rating in accordance with Table 715.4 shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test.

Exceptions:

1. Viewports that require a hole not larger than 1 inch (25 mm) in diameter through the door, have at least a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).
2. Corridor door assemblies in occupancies of Group I-2 shall be in accordance with Section 407.3.1.
3. Unprotected openings shall be permitted for corridors in multitheater complexes where each motion picture auditorium has at least one-half of its required exit or exit access doorways opening directly to the exterior or into an exit passageway.

715.4.3.1 Smoke and draft control. Fire door assemblies shall also meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. Louvers shall be prohibited. Installation of smoke doors shall be in accordance with NFPA 105.

715.4.3.2 Glazing in door assemblies. In a 20-minute fire door assembly, the glazing material in the door itself shall have a minimum fire-protection rating of 20 minutes and shall be exempt from the hose stream test. Glazing material in any other part of the door assembly, including transom lites and sidelites, shall be tested in accordance with NFPA 257, including the hose stream test, in accordance with Section 715.5.

715.4.4 Doors in exit enclosures and exit passageways. Fire door assemblies in exit enclosures and exit passageways shall have a maximum transmitted temperature end point of not more than 450°F (250°C) above ambient at the end of 30 minutes of standard fire test exposure.

Exception: The maximum transmitted temperature rise is not limited in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

715.4.4.1 Glazing in doors. Fire-protection-rated glazing in excess of 100 square inches (0.065 m²) shall be permitted in fire door assemblies when tested in accordance with NFPA 252 as components of the door assemblies and not as glass lights, and shall have a maximum transmitted temperature rise of 450°F (250°C) in accordance with Section 715.4.4.

Exception: The maximum transmitted temperature end point is not required in buildings equipped

throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

715.4.5 Labeled protective assemblies. Fire door assemblies shall be labeled by an approved agency. The labels shall comply with NFPA 80, and shall be permanently affixed to the door or frame.

715.4.5.1 Fire door labeling requirements. Fire doors shall be labeled showing the name of the manufacturer, the name of the third-party inspection agency, the fire protection rating and, where required for fire doors in exit enclosures and exit passageways by Section 715.4.4, the maximum transmitted temperature end point. Smoke and draft control doors complying with UL 1784 shall be labeled as such. Labels shall be approved and permanently affixed. The label shall be applied at the factory or location where fabrication and assembly are performed.

715.4.5.2 Oversized doors. Oversized fire doors shall bear an oversized fire door label by an approved agency or shall be provided with a certificate of inspection furnished by an approved testing agency. When a certificate of inspection is furnished by an approved testing agency, the certificate shall state that the door conforms to the requirements of design, materials and construction, but has not been subjected to the fire test.

715.4.5.3 Smoke and draft control door labeling requirements. Smoke and draft control doors complying with UL 1784 shall be labeled in accordance with Section 715.4.5.1 and shall show the letter “S” on the fire rating label of the door. This marking shall indicate that the door and frame assembly are in compliance when listed or labeled gasketing is also installed.

715.4.5.4 Fire door frame labeling requirements. Fire door frames shall be labeled showing the names of the manufacturer and the third-party inspection agency.

715.4.6 Glazing material. Fire-protection-rated glazing conforming to the opening protection requirements in Section 715.4 shall be permitted in fire door assemblies.

715.4.6.1 Size limitations. Wired glass used in fire doors shall comply with Table 715.5.3. Other fire-protection-rated glazing shall comply with the size limitations of NFPA 80.

Exceptions:

1. Fire-protection-rated glazing in fire doors located in fire walls shall be prohibited except that where serving as a horizontal exit, a self-closing swinging door shall be permitted to have a vision panel of not more than 100 square inches (0.065 m²) without a dimension exceeding 10 inches (254 mm).
2. Fire-protection-rated glazing shall not be installed in fire doors having a 1½-hour fire protection rating intended for installation in fire barriers, unless the glazing is not more than 100 square inches (0.065 m²) in area.

715.4.6.2 Exit and elevator protectives. Approved fire-protection-rated glazing used in fire door assemblies in elevator and exit enclosures shall be so located as to furnish clear vision of the passageway or approach to the elevator, ramp or stairway.

715.4.6.3 Labeling. Fire-protection-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and information required in Section 715.5.8.1 that shall be issued by an approved agency and shall be permanently affixed to the glazing.

715.4.6.3.1 Identification. For fire-protection-rated glazing, the label shall bear the following four-part identification: “D – H or NH – T or NT – XXX.” “D” indicates that the glazing shall be used in fire door assemblies and that the glazing meets the fire resistance requirements of the test standard. “H” shall indicate that the glazing meets the hose stream requirements of the test standard. “NH” shall indicate that the glazing does not meet the hose stream requirements of the test. “T” shall indicate that the glazing meets the temperature requirements of Section 715.4.4.1. “NT” shall indicate that the glazing does not meet the temperature requirements of Section 715.4.4.1. The placeholder “XXX” shall specify the fire-protection-rating period, in minutes.

715.4.6.4 Safety glazing. Fire-protection-rated glazing installed in fire doors or fire window assemblies in areas subject to human impact in hazardous locations shall comply with Chapter 24.

715.4.7 Door closing. Fire doors shall be self- or automatic closing in accordance with this section.

Exceptions:

1. Fire doors located in common walls separating sleeping units in Group R-1 shall be permitted without automatic- or self-closing devices.
2. The elevator car doors and the associated hoistway enclosure doors at the floor level designated for recall in accordance with Section 3003.2 shall be permitted to remain open during Phase I emergency recall operation.

715.4.7.1 Latch required. Unless otherwise specifically permitted, single fire doors and both leaves of pairs of side-hinged swinging fire doors shall be provided with an active latch bolt that will secure the door when it is closed.

715.4.7.2 Automatic-closing fire door assemblies. Automatic-closing fire door assemblies shall be self-closing in accordance with NFPA 80.

715.4.7.3 Smoke-activated doors. Automatic-closing doors installed in the following locations shall be automatic closing by the actuation of smoke detectors installed in accordance with Section 907.10 or by loss of power to the smoke detector or hold-open device. Doors that are automatic closing by smoke detection shall not

have more than a 10-second delay before the door starts to close after the smoke detector is actuated:

1. Doors installed across a corridor.
2. Doors that protect openings in exits or corridors required to be of fire-resistance-rated construction.
3. Doors that protect openings in walls that are capable of resisting the passage of smoke in accordance with Section 508.2.2.1.
4. Doors installed in smoke barriers in accordance with Section 709.5.
5. Doors installed in fire partitions in accordance with Section 708.6.
6. Doors installed in a fire wall in accordance with Section 705.8.
7. Doors installed in shaft enclosures in accordance with Section 707.7.
8. Doors installed in refuse and laundry chutes and access and termination rooms in accordance with Section 707.13.
9. Doors installed in the walls for compartmentation of underground buildings in accordance with Section 405.4.2.
10. Doors installed in the elevator lobby walls of underground buildings in accordance with Section 405.4.3.
11. Doors installed in smoke partitions in accordance with Section 710.5.3.

715.4.7.4 Doors in pedestrian ways. Vertical sliding or vertical rolling steel fire doors in openings through which pedestrians travel shall be heat activated or activated by smoke detectors with alarm verification.

715.4.8 Swinging fire shutters. Where fire shutters of the swinging type are installed in exterior openings, not less than one row in every three vertical rows shall be arranged to be readily opened from the outside, and shall be identified by distinguishing marks or letters not less than 6 inches (152 mm) high.

715.4.9 Rolling fire shutters. Where fire shutters of the rolling type are installed, such shutters shall include approved automatic-closing devices.

715.5 Fire-protection-rated glazing. Glazing in fire window assemblies shall be fire-protection rated in accordance with this section and Table 715.5. Glazing in fire door assemblies shall comply with Section 715.4.6. Fire-protection-rated glazing shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257. Fire-protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 704.3, 704.8, 704.9 or 704.10 shall have a fire-protection rating of not less than $\frac{3}{4}$ hour.

Exceptions:

1. Wired glass in accordance with Section 715.5.3.

**TABLE 715.5
FIRE WINDOW ASSEMBLY FIRE PROTECTION RATINGS**

TYPE OF ASSEMBLY	REQUIRED ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)
Interior walls: Fire walls Fire barriers	All > 1	NP ^a NP ^a
Smoke barriers and fire partitions	1	3/4
Exterior walls	> 1 1	1 1/2 3/4
Party wall	All	NP

NP = Not Permitted.

a. Not permitted except as specified in Section 715.2.

2. Fire-protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire-protection rating.

715.5.1 Testing under positive pressure. NFPA 257 shall evaluate fire-protection-rated glazing under positive pressure. Within the first 10 minutes of a test, the pressure in the furnace shall be adjusted so at least two-thirds of the test specimen is above the neutral pressure plane, and the neutral pressure plane shall be maintained at that height for the balance of the test.

715.5.2 Nonsymmetrical glazing systems. Nonsymmetrical fire-protection-rated glazing systems in fire partitions, fire barriers or in exterior walls with a fire separation distance of 5 feet (1524 mm) or less pursuant to Section 704 shall be tested with both faces exposed to the furnace, and the assigned fire protection rating shall be the shortest duration obtained from the two tests conducted in compliance with NFPA 257.

715.5.3 Wired glass. Steel window frame assemblies of 0.125-inch (3.2 mm) minimum solid section or of not less than nominal 0.048-inch-thick (1.2 mm) formed sheet steel members fabricated by pressing, mitering, riveting, interlocking or welding and having provision for glazing with 1/4-inch (6.4 mm) wired glass where securely installed in the building construction and glazed with 1/4-inch (6.4 mm) labeled wired glass shall be deemed to meet the requirements for a 3/4-hour fire window assembly. Wired glass panels shall conform to the size limitations set forth in Table 715.5.3.

715.5.4 Nonwired glass. Glazing other than wired glass in fire window assemblies shall be fire-protection-rated glazing installed in accordance with and complying with the size limitations set forth in NFPA 80.

715.5.5 Installation. Fire-protection-rated glazing shall be in the fixed position or be automatic-closing and shall be installed in approved frames.

715.5.6 Window mullions. Metal mullions that exceed a nominal height of 12 feet (3658 mm) shall be protected with materials to afford the same fire-resistance rating as

**TABLE 715.5.3
LIMITING SIZES OF WIRED GLASS PANELS**

OPENING FIRE PROTECTION RATING	MAXIMUM AREA (square inches)	MAXIMUM HEIGHT (inches)	MAXIMUM WIDTH (inches)
3 hours	0	0	0
1 1/2-hour doors in exterior walls	0	0	0
1 and 1 1/2 hours	100	33	10
3/4 hour	1,296	54	54
20 minutes	Not Limited	Not Limited	Not Limited
Fire window assemblies	1,296	54	54

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm².

required for the wall construction in which the protective is located.

715.5.7 Interior fire window assemblies. Fire-protection-rated glazing used in fire window assemblies located in fire partitions and fire barriers shall be limited to use in assemblies with a maximum fire-resistance rating of 1 hour in accordance with this section.

715.5.7.1 Where permitted. Fire-protection-rated glazing shall be limited to fire partitions designed in accordance with Section 708 and fire barriers utilized in the applications set forth in Sections 706.3.6 and 706.3.8 where the fire-resistance rating does not exceed 1 hour.

715.5.7.2 Size limitations. The total area of windows shall not exceed 25 percent of the area of a common wall with any room.

715.5.8 Labeling requirements. Fire-protection-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and information required in Section 715.5.8.1 that shall be issued by an approved agency and shall be permanently affixed to the glazing.

715.5.8.1 Identification. For fire-protection-rated glazing, the label shall bear the following two-part identification: "OH - XXX." "OH" indicates that the glazing meets both the fire-resistance and the hose-stream requirements of NFPA 257 and is permitted to be used in openings. "XXX" represents the fire-protection rating period, in minutes, that was tested.

SECTION 716 DUCTS AND AIR TRANSFER OPENINGS

716.1 General. The provisions of this section shall govern the protection of duct penetrations and air transfer openings in assemblies required to be protected.

716.1.1 Ducts without dampers. Ducts that penetrate fire-resistance-rated assemblies and are not required by this section to have dampers shall comply with the requirements of Section 712.

716.2 Installation. Fire dampers, smoke dampers, combination fire/smoke dampers and ceiling radiation dampers located within air distribution and smoke control systems shall be installed in accordance with the requirements of this section, the manufacturer’s installation instructions and the dampers’ listing.

716.2.1 Smoke control system. Where the installation of a fire damper will interfere with the operation of a required smoke control system in accordance with Section 909, approved alternative protection shall be utilized.

716.2.2 Hazardous exhaust ducts. Fire dampers for hazardous exhaust duct systems shall comply with the *Florida Building Code, Mechanical*.

716.3 Damper testing and ratings. Dampers shall be listed and bear the label of an approved testing agency indicating compliance with the standards in this section. Fire dampers shall comply with the requirements of UL 555. Only fire dampers labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire. Smoke dampers shall comply with the requirements of UL 555S. Combination fire/smoke dampers shall comply with the requirements of both UL 555 and UL 555S. Ceiling radiation dampers shall comply with the requirements of UL 555C.

716.3.1 Fire protection rating. Fire dampers shall have the minimum fire protection rating specified in Table 716.3.1 for the type of penetration.

**TABLE 716.3.1
FIRE DAMPER RATING**

TYPE OF PENETRATION	MINIMUM DAMPER RATING (hours)
Less than 3-hour fire-resistance-rated assemblies	1.5
3-hour or greater fire-resistance-rated assemblies	3

716.3.1.1 Fire damper actuating device. The fire damper actuating device shall meet one of the following requirements:

1. The operating temperature shall be approximately 50°F (10°C) above the normal temperature within the duct system, but not less than 160°F (71°C).
2. The operating temperature shall be not more than 286°F (141°C) where located in a smoke control system complying with Section 909.
3. Where a combination fire/smoke damper is located in a smoke control system complying with Section 909, the operating temperature rating shall be approximately 50°F (10°C) above the maximum smoke control system designed operating temperature, or a maximum temperature of 350°F (177°C). The temperature shall not exceed the UL 555S degradation test temperature rating for a combination fire/smoke damper.

716.3.2 Smoke damper ratings. Smoke damper leakage ratings shall not be less than Class II. Elevated temperature ratings shall not be less than 250°F (121°C).

716.3.2.1 Smoke damper actuation methods. The smoke damper shall close upon actuation of a listed smoke detector or detectors installed in accordance with Section 907.10 and one of the following methods, as applicable:

1. Where a damper is installed within a duct, a smoke detector shall be installed in the duct within 5 feet (1524 mm) of the damper with no air outlets or inlets between the detector and the damper. The detector shall be listed for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, dampers shall be closed upon fan shutdown where local smoke detectors require a minimum velocity to operate.
2. Where a damper is installed above smoke barrier doors in a smoke barrier, a spot-type detector listed for releasing service shall be installed on either side of the smoke barrier door opening.
3. Where a damper is installed within an unducted opening in a wall, a spot-type detector listed for releasing service shall be installed within 5 feet (1524 mm) horizontally of the damper.
4. Where a damper is installed in a corridor wall or ceiling, the damper shall be permitted to be controlled by a smoke detection system installed in the corridor.
5. Where a total-coverage smoke detector system is provided within areas served by a heating, ventilation and air-conditioning (HVAC) system, dampers shall be permitted to be controlled by the smoke detection system.

716.4 Access and identification. Fire and smoke dampers shall be provided with an approved means of access, which is large enough to permit inspection and maintenance of the damper and its operating parts. The access shall not affect the integrity of fire-resistance-rated assemblies. The access openings shall not reduce the fire-resistance rating of the assembly. Access points shall be permanently identified on the exterior by a label having letters not less than 0.5 inch (12.7 mm) in height reading: FIRE/SMOKE DAMPER, SMOKE DAMPER or FIRE DAMPER. Access doors in ducts shall be tight fitting and suitable for the required duct construction.

716.5 Where required. Fire dampers, smoke dampers, combination fire/smoke dampers and ceiling radiation dampers shall be provided at the locations prescribed in Sections 716.5.1 through 716.5.5 and Section 716.6. Where an assembly is required to have both fire dampers and smoke dampers, combination fire/smoke dampers or a fire damper and a smoke damper shall be required.

716.5.1 Fire walls. Ducts and air transfer openings permitted in fire walls in accordance with Section 705.11 shall be protected with listed fire dampers installed in accordance with their listing.

716.5.2 Fire barriers. Ducts and air transfer openings of fire barriers shall be protected with approved fire dampers installed in accordance with their listings. Ducts and air

transfer openings shall not penetrate exit enclosures and exit passageways except as permitted by Sections 1020.1.2 and 1021.5, respectively.

Exception: Fire dampers are not required at penetrations of fire barriers where any of the following apply:

1. Penetrations are tested in accordance with ASTM E 119 as part of the fire-resistance-rated assembly.
2. Ducts are used as part of an approved smoke control system in accordance with Section 909 and where the use of a fire damper would interfere with the operation of a smoke control system.
3. Such walls are penetrated by ducted HVAC systems, have a required fire-resistance rating of 1 hour or less, are in areas of other than Group H and are in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. For the purposes of this exception, a ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the air outlet and inlet terminals.

716.5.3 Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with listed fire and smoke dampers installed in accordance with their listing.

Exceptions:

1. Fire dampers are not required at penetrations of shafts where:
 - 1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
 - 1.2. Penetrations are tested in accordance with ASTM E 119 as part of the fire-resistance-rated assembly; or
 - 1.3. Ducts are used as part of an approved smoke control system in accordance with Section 909 and where the fire damper will interfere with the operation of the smoke control system; or
 - 1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies, equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, smoke dampers are not required at penetrations of shafts where:
 - 2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a wall thickness of at least 0.019 inch (0.48 mm); and

2.2. That extend at least 22 inches (559 mm) vertically; and

2.3. An exhaust fan is installed at the upper terminus of the shaft that is, powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.

3. Smoke dampers are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.

4. Smoke dampers are not required at penetrations of shafts where ducts are used as part of an approved mechanical smoke control system designed in accordance with Section 909 and where the smoke damper will interfere with the operation of the smoke control system.

716.5.4 Fire partitions. Ducts and air transfer openings that penetrate fire partitions shall be protected with listed fire dampers installed in accordance with their listing.

Exceptions: In occupancies other than Group H, fire dampers are not required where:

1. The duct system is constructed of approved materials in accordance with the *Florida Building Code, Mechanical* and the duct penetrating the wall complies with all of the following requirements:

1.1. The duct shall not exceed 100 square inches (0.06 m²).

1.2. The duct shall be constructed of steel a minimum of 0.0217 inch (0.55 mm) in thickness.

1.3. The duct shall not have openings that communicate the corridor with adjacent spaces or rooms.

1.4. The duct shall be installed above a ceiling.

1.5. The duct shall not terminate at a wall register in the fire-resistance-rated wall.

1.6. A minimum 12-inch-long (305 mm) by 0.060-inch-thick (1.52 mm) steel sleeve shall be centered in each duct opening. The sleeve shall be secured to both sides of the wall and all four sides of the sleeve with minimum 1¹/₂-inch by 1¹/₂-inch by 0.060-inch (38 mm by 38 mm by 1.52 mm) steel retaining angles. The retaining angles shall be secured to the sleeve and the wall with No. 10 (M5) screws. The annular space between the steel sleeve and the wall opening shall be filled with mineral wool batting on all sides.

2. Tenant partitions in covered mall buildings where the walls are not required by provisions elsewhere in the code to extend to the underside of the floor roof deck above.

716.5.4.1 Corridors. A listed smoke damper designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a corridor enclosure required to have smoke and draft control doors in accordance with Section 715.4.3.

Exceptions:

1. Smoke dampers are not required where the building is equipped throughout with an approved smoke control system in accordance with Section 909, and smoke dampers are not necessary for the operation and control of the system.
2. Smoke dampers are not required in corridor penetrations where the duct is constructed of steel not less than 0.019 inch (0.48 mm) in thickness and there are no openings serving the corridor.

716.5.5 Smoke barriers. A listed smoke damper designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a smoke barrier. Smoke dampers and smoke damper actuation methods shall comply with Section 716.3.2.1.

Exception: Smoke dampers are not required where the openings in ducts are limited to a single smoke compartment and the ducts are constructed of steel.

716.6 Horizontal assemblies. Penetrations by ducts and air transfer openings of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall be protected by a shaft enclosure that complies with Section 707 or shall comply with Sections 716.6.1 through 716.6.3.

716.6.1 Through penetrations. In occupancies other than Groups I-2 and I-3, a duct constructed of approved materials in accordance with the *Florida Building Code, Mechanical* that penetrates a fire-resistance-rated floor/ceiling assembly that connects not more than two stories is permitted without shaft enclosure protection, provided a listed fire damper is installed at the floor line or the duct is protected in accordance with Section 712.4. For air transfer openings, see Exception 7 to Section 707.2.

Exception: A duct is permitted to penetrate three floors or less without a fire damper at each floor, provided it meets all of the following requirements:

1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel not less than 0.019 inch (0.48 mm) (26 gage) in thickness.
2. The duct shall open into only one dwelling or sleeping unit and the duct system shall be continuous from the unit to the exterior of the building.
3. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m²) in any 100 square feet (9.3 m²) of floor area.
4. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste

where subjected to ASTM E 119 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.

5. Grille openings located in a ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with a listed ceiling radiation damper installed in accordance with Section 716.6.2.1.

716.6.2 Membrane penetrations. Ducts and air transfer openings constructed of approved materials in accordance with the *Florida Building Code, Mechanical* that penetrate the ceiling membrane of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with one of the following:

1. A shaft enclosure in accordance with Section 707.
2. A listed ceiling radiation damper installed at the ceiling line where a duct penetrates the ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly.
3. A listed ceiling radiation damper installed at the ceiling line where a diffuser with no duct attached penetrates the ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly.

716.6.2.1 Ceiling radiation dampers. Ceiling radiation dampers shall be tested in accordance with UL 555C and installed in accordance with the manufacturer's installation instructions and listing. Ceiling radiation dampers are not required where either of the following applies:

1. Tests in accordance with ASTM E 119 have shown that ceiling radiation dampers are not necessary in order to maintain the fire-resistance rating of the assembly.
2. Where exhaust duct penetrations are protected in accordance with Section 712.4.1.2, are located within the cavity of a wall and do not pass through another dwelling unit or tenant space.

716.6.3 Nonfire-resistance-rated floor assemblies. Duct systems constructed of approved materials in accordance with the *Florida Building Code, Mechanical* that penetrate nonfire-resistance-rated floor assemblies shall be protected by any of the following methods:

1. A shaft enclosure in accordance with Section 707.
2. The duct connects not more than two stories, the annular space around the penetrating duct is protected with an approved noncombustible material that resists the free passage of flame and the products of combustion.
3. The duct connects not more than three stories, the annular space around the penetrating duct is protected with an approved noncombustible material that resists the free passage of flame and the products of combustion and a fire damper is installed at each floor line.

Exception: Fire dampers are not required in ducts within individual residential dwelling units.

716.7 Flexible ducts and air connectors. Flexible ducts and air connectors shall not pass through any fire-resistance-rated assembly. Flexible air connectors shall not pass through any wall, floor or ceiling.

SECTION 717 CONCEALED SPACES

717.1 General. Fireblocking and draftstopping shall be installed in combustible concealed locations in accordance with this section. Fireblocking shall comply with Section 717.2. Draftstopping in floor/ceiling spaces and attic spaces shall comply with Sections 717.3 and 717.4, respectively. The permitted use of combustible materials in concealed spaces of buildings of Type I or II construction shall be limited to the applications indicated in Section 717.5.

717.2 Fireblocking. In combustible construction, fireblocking shall be installed to cut off concealed draft openings (both vertical and horizontal) and shall form an effective barrier between floors, between a top story and a roof or attic space. Fireblocking shall be installed in the locations specified in Sections 717.2.2 through 717.2.7.

717.2.1 Fireblocking materials. Fireblocking shall consist of 2-inch (51 mm) nominal lumber or two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints or one thickness of 0.719-inch (18.3 mm) wood structural panel with joints backed by 0.719-inch (18.3 mm) wood structural panel or one thickness of 0.75-inch (19 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard. Gypsum board, cement fiber board, batts or blankets of mineral wool, glass fiber or other approved materials installed in such a manner as to be securely retained in place shall be permitted as an acceptable fireblock. Batts or blankets of mineral or glass fiber or other approved nonrigid materials shall be permitted for compliance with the 10-foot (3048 mm) horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs. Loose-fill insulation material shall not be used as a fireblock unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases. The integrity of fireblocks shall be maintained.

717.2.1.1 Double stud walls. Batts or blankets of mineral or glass fiber or other approved nonrigid materials shall be allowed as fireblocking in walls constructed using parallel rows of studs or staggered studs.

717.2.2 Concealed wall spaces. Fireblocking shall be provided in concealed spaces of stud walls and partitions, including furred spaces, and parallel rows of studs or staggered studs, as follows:

1. Vertically at the ceiling and floor levels.
2. Horizontally at intervals not exceeding 10 feet (3048 mm).

717.2.3 Connections between horizontal and vertical spaces. Fireblocking shall be provided at interconnections

between concealed vertical stud wall or partition spaces and concealed horizontal spaces created by an assembly of floor joists or trusses, and between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings, cove ceilings and similar locations.

717.2.4 Stairways. Fireblocking shall be provided in concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall also comply with Section 1009.5.3.

717.2.5 Ceiling and floor openings. Where annular space protection is provided in accordance with Exception 6 of Section 707.2, Exception 1 of Section 712.4.1.2, or Section 712.4.2, fireblocking shall be installed at openings around vents, pipes, ducts, chimneys and fireplaces at ceiling and floor levels, with an approved material to resist the free passage of flame and the products of combustion. Factory-built chimneys and fireplaces shall be fireblocked in accordance with UL 103 and UL 127.

717.2.6 Architectural trim. Fireblocking shall be installed within concealed spaces of exterior wall finish and other exterior architectural elements where permitted to be of combustible construction as specified in Section 1406 or where erected with combustible frames, at maximum intervals of 20 feet (6096 mm), so that there will be no open space exceeding 100 square feet (9.3 m²). Where wood furring strips are used, they shall be of approved wood of natural decay resistance or preservative-treated wood. If noncontinuous, such elements shall have closed ends, with at least 4 inches (102 mm) of separation between sections.

Exceptions:

1. Fireblocking of cornices is not required in single-family dwellings. Fireblocking of cornices of a two-family dwelling is required only at the line of dwelling unit separation.
2. Fireblocking shall not be required where installed on noncombustible framing and the face of the exterior wall finish exposed to the concealed space is covered by one of the following materials:
 - 2.1. Aluminum having a minimum thickness of 0.019 inch (0.5 mm).
 - 2.2. Corrosion-resistant steel having a base metal thickness not less than 0.016 inch (0.4 mm) at any point.
 - 2.3. Other approved noncombustible materials.

717.2.7 Concealed sleeper spaces. Where wood sleepers are used for laying wood flooring on masonry or concrete fire-resistance-rated floors, the space between the floor slab and the underside of the wood flooring shall be filled with an approved material to resist the free passage of flame and products of combustion or fireblocked in such a manner that there will be no open spaces under the flooring that will exceed 100 square feet (9.3 m²) in area and such space shall be filled solidly under permanent partitions so that there is no communication under the flooring between adjoining rooms.

Exceptions:

1. Fireblocking is not required for slab-on-grade floors in gymnasiums.
2. Fireblocking is required only at the juncture of each alternate lane and at the ends of each lane in a bowling facility.

717.3 Draftstopping in floors. In combustible construction, draftstopping shall be installed to subdivide floor/ceiling assemblies in the locations prescribed in Sections 717.3.2 through 717.3.3.

717.3.1 Draftstopping materials. Draftstopping materials shall not be less than 0.5-inch (12.7 mm) gypsum board, 0.375-inch (9.5 mm) wood structural panel, 0.375-inch (9.5 mm) particleboard, 1-inch (25-mm) nominal lumber, cement fiberboard, batts or blankets of mineral wool or glass fiber, or other approved materials adequately supported. The integrity of draftstops shall be maintained.

717.3.2 Groups R-1, R-2, R-3 and R-4. Draftstopping shall be provided in floor/ceiling spaces in Group R-1 buildings, in Group R-2 buildings with three or more dwelling units, in Group R-3 buildings with two dwelling units and in Group R-4 buildings. Draftstopping shall be located above and in line with the dwelling unit and sleeping unit separations.

Exceptions:

1. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2, provided that automatic sprinklers are also installed in the combustible concealed spaces.

717.3.3 Other groups. In other groups, draftstopping shall be installed so that horizontal floor areas do not exceed 1,000 square feet (93 m²).

Exception: Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

717.4 Draftstopping in attics. In combustible construction, draftstopping shall be installed to subdivide attic spaces and concealed roof spaces in the locations prescribed in Sections 717.4.2 and 717.4.3. Ventilation of concealed roof spaces shall be maintained in accordance with Section 1203.2.

717.4.1 Draftstopping materials. Materials utilized for draftstopping of attic spaces shall comply with Section 717.3.1.

717.4.1.1 Openings. Openings in the partitions shall be protected by self-closing doors with automatic latches constructed as required for the partitions.

717.4.2 Groups R-1 and R-2. Draftstopping shall be provided in attics, mansards, overhangs or other concealed roof spaces of Group R-2 buildings with three or more dwelling units and in all Group R-1 buildings. Draftstopping shall be installed above, and in line with, sleeping unit and dwelling

unit separation walls that do not extend to the underside of the roof sheathing above.

Exceptions:

1. Where corridor walls provide a sleeping unit or dwelling unit separation, draftstopping shall only be required above one of the corridor walls.
2. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. In occupancies in Group R-2 that do not exceed four stories in height, the attic space shall be subdivided by draftstops into areas not exceeding 3,000 square feet (279 m²) or above every two dwelling units, whichever is smaller.
4. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2, provided that automatic sprinklers are also installed in the combustible concealed spaces.

717.4.3 Other groups. Draftstopping shall be installed in attics and concealed roof spaces, such that any horizontal area does not exceed 3,000 square feet (279 m²).

Exception: Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

717.5 Combustible materials in concealed spaces in Type I or II construction. Combustible materials shall not be permitted in concealed spaces of buildings of Type I or II construction.

Exceptions:

1. Combustible materials in accordance with Section 603.
2. Combustible materials exposed within plenums complying with Section 602 of the *Florida Building Code, Mechanical*.
3. Class A interior finish materials classified in accordance with Section 803.
4. Combustible piping within partitions or shaft enclosures installed in accordance with the provisions of this code.
5. Combustible piping within concealed ceiling spaces installed in accordance with the *Florida Building Code, Mechanical* and the *Florida Building Code, Plumbing*.
6. Combustible insulation and covering on pipe and tubing, installed in concealed spaces other than plenums, complying with Section 719.7.

SECTION 718 FIRE-RESISTANCE REQUIREMENTS FOR PLASTER

718.1 Thickness of plaster. The minimum thickness of gypsum plaster or portland cement plaster used in a fire-resis-

tance-rated system shall be determined by the prescribed fire tests. The plaster thickness shall be measured from the face of the lath where applied to gypsum lath or metal lath.

718.2 Plaster equivalents. For fire-resistance purposes, 0.5 inch (12.7 mm) of unsanded gypsum plaster shall be deemed equivalent to 0.75 inch (19.1 mm) of one-to-three gypsum sand plaster or 1 inch (25 mm) of portland cement sand plaster.

718.3 Noncombustible furring. In buildings of Type I and II construction, plaster shall be applied directly on concrete or masonry or on approved noncombustible plastering base and furring.

718.4 Double reinforcement. Plaster protection more than 1 inch (25 mm) in thickness shall be reinforced with an additional layer of approved lath embedded at least 0.75 inch (19.1 mm) from the outer surface and fixed securely in place.

Exception: Solid plaster partitions or where otherwise determined by fire tests.

718.5 Plaster alternatives for concrete. In reinforced concrete construction, gypsum plaster or portland cement plaster is permitted to be substituted for 0.5 inch (12.7 mm) of the required poured concrete protection, except that a minimum thickness of 0.375 inch (9.5 mm) of poured concrete shall be provided in reinforced concrete floors and 1 inch (25 mm) in reinforced concrete columns in addition to the plaster finish. The concrete base shall be prepared in accordance with Section 2510.7.

SECTION 719 THERMAL- AND SOUND-INSULATING MATERIALS

719.1 General. Insulating materials, including facings such as vapor retarders and vapor-permeable membranes, similar coverings, and all layers of single and multilayer reflective foil insulations, shall comply with the requirements of this section. Where a flame spread index or a smoke-developed index is specified in this section, such index shall be determined in accordance with ASTM E 84. Any material that is subject to an increase in flame spread index or smoke-developed index beyond the limits herein established through the effects of age, moisture, or other atmospheric conditions shall not be permitted.

Exceptions:

1. Fiberboard insulation shall comply with Chapter 23.
2. Foam plastic insulation shall comply with Chapter 26.
3. Duct and pipe insulation and duct and pipe coverings and linings in plenums shall comply with the *Florida Building Code, Mechanical*.

719.2 Concealed installation. Insulating materials, where concealed as installed in buildings of any type of construction, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

Exception: Cellulose loose-fill insulation that is not spray applied, complying with the requirements of Section 719.6, shall only be required to meet the smoke-developed index of not more than 450.

719.2.1 Facings. Where such materials are installed in concealed spaces in buildings of Type III, IV or V construction, the flame spread and smoke-developed limitations do not apply to facings, coverings, and layers of reflective foil insulation that are installed behind and in substantial contact with the unexposed surface of the ceiling, wall or floor finish.

719.3 Exposed installation. Insulating materials, where exposed as installed in buildings of any type of construction, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

Exception: Cellulose loose-fill insulation that is not spray applied complying with the requirements of Section 719.6 shall only be required to meet the smoke-developed index of not more than 450.

719.3.1 Attic floors. Exposed insulation materials installed on attic floors shall have a critical radiant flux of not less than 0.12 watt per square centimeter when tested in accordance with ASTM E 970.

719.4 Loose-fill insulation. Loose-fill insulation materials that cannot be mounted in the ASTM E 84 apparatus without a screen or artificial supports shall comply with the flame spread and smoke-developed limits of Sections 719.2 and 719.3 when tested in accordance with CAN/ULC S102.2.

Exception: Cellulose loose-fill insulation shall not be required to comply with the flame spread index requirement of CAN/ULC S102.2, provided such insulation complies with the requirements of Section 719.6.

719.5 Roof insulation. The use of combustible roof insulation not complying with Sections 719.2 and 719.3 shall be permitted in any type of construction provided it is covered with approved roof coverings directly applied thereto.

719.6 Cellulose loose-fill insulation. Cellulose loose-fill insulation shall comply with CPSC 16 CFR, Part 1209 and CPSC 16 CFR, Part 1404. Each package of such insulating material shall be clearly labeled in accordance with CPSC 16 CFR, Part 1209 and CPSC 16 CFR, Part 1404.

719.7 Insulation and covering on pipe and tubing. Insulation and covering on pipe and tubing shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

Exception: Insulation and covering on pipe and tubing installed in plenums shall comply with the *Florida Building Code, Mechanical*.

SECTION 720 PRESCRIPTIVE FIRE RESISTANCE

720.1 General. The provisions of this section contain prescriptive details of fire-resistance-rated building elements. The materials of construction listed in Tables 720.1(1), 720.1(2), and 720.1(3) shall be assumed to have the fire-resistance ratings prescribed therein. Where materials that change the capacity for heat dissipation are incorporated into a fire-resistance-rated assembly, fire test results or other substantiating data shall be made available to the building official to

show that the required fire-resistance-rating time period is not reduced.

720.1.1 Thickness of protective coverings. The thickness of fire-resistant materials required for protection of structural members shall be not less than set forth in Table 720.1(1), except as modified in this section. The figures shown shall be the net thickness of the protecting materials and shall not include any hollow space in back of the protection.

720.1.2 Unit masonry protection. Where required, metal ties shall be embedded in bed joints of unit masonry for protection of steel columns. Such ties shall be as set forth in Table 720.1(1) or be equivalent thereto.

720.1.3 Reinforcement for cast-in-place concrete column protection. Cast-in-place concrete protection for steel columns shall be reinforced at the edges of such members with wire ties of not less than 0.18 inch (4.6 mm) in diameter wound spirally around the columns on a pitch of not more than 8 inches (203 mm) or by equivalent reinforcement.

720.1.4 Plaster application. The finish coat is not required for plaster protective coatings where they comply with the design mix and thickness requirements of Tables 720.1(1), 720.1(2) and 720.1(3).

720.1.5 Bonded prestressed concrete tendons. For members having a single tendon or more than one tendon installed with equal concrete cover measured from the nearest surface, the cover shall not be less than that set forth in Table 720.1(1). For members having multiple tendons installed with variable concrete cover, the average tendon cover shall not be less than that set forth in Table 720.1(1), provided:

1. The clearance from each tendon to the nearest exposed surface is used to determine the average cover.
2. In no case can the clear cover for individual tendons be less than one-half of that set forth in Table 720.1(1). A minimum cover of 0.75 inch (19.1 mm) for slabs and 1 inch (25 mm) for beams is required for any aggregate concrete.
3. For the purpose of establishing a fire-resistance rating, tendons having a clear covering less than that set forth in Table 720.1(1) shall not contribute more than 50 percent of the required ultimate moment capacity for members less than 350 square inches (0.226 m²) in cross-sectional area and 65 percent for larger members. For structural design purposes, however, tendons having a reduced cover are assumed to be fully effective.

SECTION 721 CALCULATED FIRE RESISTANCE

721.1 General. The provisions of this section contain procedures by which the fire resistance of specific materials or combinations of materials is established by calculations. These procedures apply only to the information contained in this section and shall not be otherwise used. The calculated fire resis-

tance of concrete, concrete masonry, and clay masonry assemblies shall be permitted in accordance with ACI 216.1/TMS 0216. The calculated fire resistance of steel assemblies shall be permitted in accordance with Chapter 5 of ASCE 29.

721.1.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

CERAMIC FIBER BLANKET. A mineral wool insulation material made of alumina-silica fibers and weighing 4 to 10 pounds per cubic foot (pcf) (64 to 160 kg/m³).

CONCRETE, CARBONATE AGGREGATE. Concrete made with aggregates consisting mainly of calcium or magnesium carbonate, such as limestone or dolomite, and containing 40 percent or less quartz, chert, or flint.

CONCRETE, CELLULAR. A lightweight insulating concrete made by mixing a preformed foam with portland cement slurry and having a dry unit weight of approximately 30 pcf (480 kg/m³).

CONCRETE, LIGHTWEIGHT AGGREGATE. Concrete made with aggregates of expanded clay, shale, slag or slate or sintered fly ash or any natural lightweight aggregate meeting ASTM C 330 and possessing equivalent fire-resistance properties and weighing 85 to 115 pcf (1360 to 1840 kg/m³).

CONCRETE, PERLITE. A lightweight insulating concrete having a dry unit weight of approximately 30 pcf (480 kg/m³) made with perlite concrete aggregate. Perlite aggregate is produced from a volcanic rock which, when heated, expands to form a glass-like material of cellular structure.

CONCRETE, SAND-LIGHTWEIGHT. Concrete made with a combination of expanded clay, shale, slag, slate, sintered fly ash, or any natural lightweight aggregate meeting ASTM C 330 and possessing equivalent fire-resistance properties and natural sand. Its unit weight is generally between 105 and 120 pcf (1680 and 1920 kg/m³).

CONCRETE, SILICEOUS AGGREGATE. Concrete made with normal-weight aggregates consisting mainly of silica or compounds other than calcium or magnesium carbonate, which contains more than 40-percent quartz, chert, or flint.

CONCRETE, VERMICULITE. A lightweight insulating concrete made with vermiculite concrete aggregate which is laminated micaceous material produced by expanding the ore at high temperatures. When added to a portland cement slurry the resulting concrete has a dry unit weight of approximately 30 pcf (480 kg/m³).

GLASS FIBERBOARD. Fibrous glass roof insulation consisting of inorganic glass fibers formed into rigid boards using a binder. The board has a top surface faced with asphalt and kraft reinforced with glass fiber.

MINERAL BOARD. A rigid felted thermal insulation board consisting of either felted mineral fiber or cellular beads of expanded aggregate formed into flat rectangular units.

TABLE 720.1(1)
MINIMUM PROTECTION OF STRUCTURAL PARTS BASED ON TIME PERIODS
FOR VARIOUS NONCOMBUSTIBLE INSULATING MATERIALS^m

STRUCTURAL PARTS TO BE PROTECTED	ITEM NUMBER	INSULATING MATERIAL USED	MINIMUM THICKNESS OF INSULATING MATERIAL FOR THE FOLLOWING FIRE-RESISTANCE PERIODS (inches)			
			4 hour	3 hour	2 hour	1 hour
1. Steel columns and all of primary trusses	1-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete, members 6" × 6" or greater (not including sandstone, granite and siliceous gravel). ^a	2 ¹ / ₂	2	1 ¹ / ₂	1
	1-1.2	Carbonate, lightweight and sand-lightweight aggregate concrete, members 8" × 8" or greater (not including sandstone, granite and siliceous gravel). ^a	2	1 ¹ / ₂	1	1
	1-1.3	Carbonate, lightweight and sand-lightweight aggregate concrete, members 12" × 12" or greater (not including sandstone, granite and siliceous gravel). ^a	1 ¹ / ₂	1	1	1
	1-1.4	Siliceous aggregate concrete and concrete excluded in Item 1-1.1, members 6" × 6" or greater. ^a	3	2	1 ¹ / ₂	1
	1-1.5	Siliceous aggregate concrete and concrete excluded in Item 1-1.1, members 8" × 8" or greater. ^a	2 ¹ / ₂	2	1	1
	1-1.6	Siliceous aggregate concrete and concrete excluded in Item 1-1.1, members 12" × 12" or greater. ^a	2	1	1	1
	1-2.1	Clay or shale brick with brick and mortar fill. ^a	3 ³ / ₄	—	—	2 ¹ / ₄
	1-3.1	4" hollow clay tile in two 2" layers; 1/2" mortar between tile and column; 3/8" metal mesh 0.046" wire diameter in horizontal joints; tile fill. ^a	4	—	—	—
	1-3.2	2" hollow clay tile; 3/4" mortar between tile and column; 3/8" metal mesh 0.046" wire diameter in horizontal joints; limestone concrete fill; ^a plastered with 3/4" gypsum plaster.	3	—	—	—
	1-3.3	2" hollow clay tile with outside wire ties 0.08" diameter at each course of tile or 3/8" metal mesh 0.046" diameter wire in horizontal joints; limestone or trap-rock concrete fill ^a extending 1" outside column on all sides.	—	—	3	—
	1-3.4	2" hollow clay tile with outside wire ties 0.08" diameter at each course of tile with or without concrete fill; 3/4" mortar between tile and column.	—	—	—	2
	1-4.1	Cement plaster over metal lath wire tied to 3/4" cold-rolled vertical channels with 0.049" (No. 18 B.W. gage) wire ties spaced 3" to 6" on center. Plaster mixed 1:2 1/2 by volume, cement to sand.	—	—	2 ¹ / ₂ ^b	7/8
	1-5.1	Vermiculite concrete, 1:4 mix by volume over paperbacked wire fabric lath wrapped directly around column with additional 2" × 2" 0.065"/0.065" (No. 16/16 B.W. gage) wire fabric placed 3/4" from outer concrete surface. Wire fabric tied with 0.049" (No. 18 B.W. gage) wire spaced 6" on center for inner layer and 2" on center for outer layer.	2	—	—	—
	1-6.1	Perlite or vermiculite gypsum plaster over metal lath wrapped around column and furred 1 1/4" from column flanges. Sheets lapped at ends and tied at 6" intervals with 0.049" (No. 18 B.W. gage) tie wire. Plaster pushed through to flanges.	1 1/2	1	—	—
	1-6.2	Perlite or vermiculite gypsum plaster over self-furring metal lath wrapped directly around column, lapped 1" and tied at 6" intervals with 0.049" (No. 18 B.W. gage) wire.	1 3/4	1 3/8	1	—
	1-6.3	Perlite or vermiculite gypsum plaster on metal lath applied to 3/4" cold-rolled channels spaced 24" apart vertically and wrapped flatwise around column.	1 1/2	—	—	—
	1-6.4	Perlite or vermiculite gypsum plaster over two layers of 1/2" plain full-length gypsum lath applied tight to column flanges. Lath wrapped with 1" hexagonal mesh of No. 20 gage wire and tied with doubled 0.035" diameter (No. 18 B.W. gage) wire ties spaced 23" on center. For three-coat work, the plaster mix for the second coat shall not exceed 100 pounds of gypsum to 2 1/2 cubic feet of aggregate for the 3-hour system.	2 1/2	2	—	—

(continued)

TABLE 720.1(1)—continued
 MINIMUM PROTECTION OF STRUCTURAL PARTS BASED ON TIME PERIODS
 FOR VARIOUS NONCOMBUSTIBLE INSULATING MATERIALS^m

STRUCTURAL PARTS TO BE PROTECTED	ITEM NUMBER	INSULATING MATERIAL USED	MINIMUM THICKNESS OF INSULATING MATERIAL FOR THE FOLLOWING FIRE-RESISTANCE PERIODS (inches)			
			4 hour	3 hour	2 hour	1 hour
1. Steel columns and all of primary trusses (continued)	1-6.5	Perlite or vermiculate gypsum plaster over one layer of 1/2" plain full-length gypsum lath applied tight to column flanges. Lath tied with doubled 0.049" (No. 18 B.W. gage) wire ties spaced 23" on center and scratch coat wrapped with 1" hexagonal mesh 0.035" (No. 20 B.W. gage) wire fabric. For three-coat work, the plaster mix for the second coat shall not exceed 100 pounds of gypsum to 2 1/2 cubic feet of aggregate.	—	2	—	—
	1-7.1	Multiple layers of 1/2" gypsum wallboard ^c adhesively ^d secured to column flanges and successive layers. Wallboard applied without horizontal joints. Corner edges of each layer staggered. Wallboard layer below outer layer secured to column with doubled 0.049" (No. 18 B.W. gage) steel wire ties spaced 15" on center. Exposed corners taped and treated.	—	—	2	1
	1-7.2	Three layers of 5/8" Type X gypsum wallboard. ^c First and second layer held in place by 1/8" diameter by 1 3/8" long ring shank nails with 5/16" diameter heads spaced 24" on center at corners. Middle layer also secured with metal straps at mid-height and 18" from each end, and by metal corner bead at each corner held by the metal straps. Third layer attached to corner bead with 1" long gypsum wallboard screws spaced 12" on center.	—	—	1 7/8	—
	1-7.3	Three layers of 5/8" Type X gypsum wallboard, ^c each layer screw attached to 1 5/8" steel studs 0.018" thick (No. 25 carbon sheet steel gage) at each corner of column. Middle layer also secured with 0.049" (No. 18 B.W. gage) double-strand steel wire ties, 24" on center. Screws are No. 6 by 1" spaced 24" on center for inner layer, No. 6 by 1 5/8" spaced 12" on center for middle layer and No. 8 by 2 1/4" spaced 12" on center for outer layer.	—	1 7/8	—	—
	1-8.1	Wood-fibered gypsum plaster mixed 1:1 by weight gypsum-to-sand aggregate applied over metal lath. Lath lapped 1" and tied 6" on center at all end, edges and spacers with 0.049" (No. 18 B.W. gage) steel tie wires. Lath applied over 1/2" spacers made of 3/4" furring channel with 2" legs bent around each corner. Spacers located 1" from top and bottom of member and a maximum of 40" on center and wire tied with a single strand of 0.049" (No. 18 B.W. gage) steel tie wires. Corner bead tied to the lath at 6" on center along each corner to provide plaster thickness.	—	—	1 5/8	—
	1-9.1	Minimum W8x35 wide flange steel column (w/d ≥ 0.75) with each web cavity filled even with the flange tip with normal weight carbonate or siliceous aggregate concrete (3,000 psi minimum compressive strength with 145 pcf ± 3 pcf unit weight). Reinforce the concrete in each web cavity with a minimum No. 4 deformed reinforcing bar installed vertically and centered in the cavity, and secured to the column web with a minimum No. 2 horizontal deformed reinforcing bar welded to the web every 18" on center vertically. As an alternative to the No. 4 rebar, 3/4" diameter by 3" long headed studs, spaced at 12" on center vertically, shall be welded on each side of the web midway between the column flanges.	—	—	—	See Note n
2. Webs or flanges of steel beams and girders	2-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete (not including sandstone, granite and siliceous gravel) with 3" or finer metal mesh placed 1" from the finished surface anchored to the top flange and providing not less than 0.025 square inch of steel area per foot in each direction.	2	1 1/2	1	1
	2-1.2	Siliceous aggregate concrete and concrete excluded in Item 2-1.1 with 3" or finer metal mesh placed 1" from the finished surface anchored to the top flange and providing not less than 0.025 square inch of steel area per foot in each direction.	2 1/2	2	1 1/2	1
	2-2.1	Cement plaster on metal lath attached to 3/4" cold-rolled channels with 0.04" (No. 18 B.W. gage) wire ties spaced 3" to 6" on center. Plaster mixed 1:2 1/2 by volume, cement to sand.	—	—	2 1/2 ^b	7/8

(continued)

TABLE 720.1(1)—continued
 MINIMUM PROTECTION OF STRUCTURAL PARTS BASED ON TIME PERIODS
 FOR VARIOUS NONCOMBUSTIBLE INSULATING MATERIALS^m

STRUCTURAL PARTS TO BE PROTECTED	ITEM NUMBER	INSULATING MATERIAL USED	MINIMUM THICKNESS OF INSULATING MATERIAL FOR THE FOLLOWING FIRE-RESISTANCE PERIODS (inches)			
			4 hour	3 hour	2 hour	1 hour
2. Webs or flanges of steel beams and girders (continued)	2-3.1	Vermiculite gypsum plaster on a metal lath cage, wire tied to 0.165" diameter (No. 8 B.W. gage) steel wire hangers wrapped around beam and spaced 16" on center. Metal lath ties spaced approximately 5" on center at cage sides and bottom.	—	7/8	—	—
	2-4.1	Two layers of 5/8" Type X gypsum wallboard ^c are attached to U-shaped brackets spaced 24" on center. 0.018" thick (No. 25 carbon sheet steel gage) 1 5/8" deep by 1" galvanized steel runner channels are first installed parallel to and on each side of the top beam flange to provide a 1/2" clearance to the flange. The channel runners are attached to steel deck or concrete floor construction with approved fasteners spaced 12" on center. U-shaped brackets are formed from members identical to the channel runners. At the bent portion of the U-shaped bracket, the flanges of the channel are cut out so that 1 5/8" deep corner channels can be inserted without attachment parallel to each side of the lower flange. As an alternate, 0.021" thick (No. 24 carbon sheet steel gage) 1" x 2" runner and corner angles may be used in lieu of channels, and the web cutouts in the U-shaped brackets may be omitted. Each angle is attached to the bracket with 1/2"-long No. 8 self-drilling screws. The vertical legs of the U-shaped bracket are attached to the runners with one 1/2" long No. 8 self-drilling screw. The completed steel framing provides a 2 1/8" and 1 1/2" space between the inner layer of wallboard and the sides and bottom of the steel beam, respectively. The inner layer of wallboard is attached to the top runners and bottom corner channels or corner angles with 1 1/4"-long No. 6 self-drilling screws spaced 16" on center. The outer layer of wallboard is applied with 1 3/4"-long No. 6 self-drilling screws spaced 8" on center. The bottom corners are reinforced with metal corner beads.	—	—	1 1/4	—
	2-4.2	Three layers of 5/8" Type X gypsum wallboard ^c attached to a steel suspension system as described immediately above utilizing the 0.018" thick (No. 25 carbon sheet steel gage) 1" x 2" lower corner angles. The framing is located so that a 2 1/8" and 2" space is provided between the inner layer of wallboard and the sides and bottom of the beam, respectively. The first two layers of wallboard are attached as described immediately above. A layer of 0.035" thick (No. 20 B.W. gage) 1" hexagonal galvanized wire mesh is applied under the soffit of the middle layer and up the sides approximately 2". The mesh is held in position with the No. 6 1 5/8"-long screws installed in the vertical leg of the bottom corner angles. The outer layer of wallboard is attached with No. 6 2 1/4"-long screws spaced 8" on center. One screw is also installed at the mid-depth of the bracket in each layer. Bottom corners are finished as described above.	—	1 7/8	—	—
	3. Bonded pretensioned reinforcement in prestressed concrete ^e	3-1.1	Carbonate, lightweight, sand-lightweight and siliceous ^f aggregate concrete Beams or girders Solid slabs ^h	4 ^g —	3 ^g 2	2 1/2 1 1/2
4. Bonded or unbonded post-tensioned tendons in prestressed concrete ^{e, i}	4-1.1	Carbonate, lightweight, sand-lightweight and siliceous ^f aggregate concrete Unrestrained members: Solid slabs ^h Beams and girders ^j 8" wide greater than 12" wide	— 3	2 4 1/2 2 1/2	1 1/2 2 1/2 2	— 1 3/4 1 1/2
	4-1.2	Carbonate, lightweight, sand-lightweight and siliceous aggregate Restrained members: ^k Solid slabs ^h Beams and girders ^j 8" wide greater than 12" wide	1 1/4 2 1/2 2	1 2 1 3/4	3/4 1 3/4 1 1/2	— — —

(continued)

**TABLE 720.1(1)—continued
MINIMUM PROTECTION OF STRUCTURAL PARTS BASED ON TIME PERIODS
FOR VARIOUS NONCOMBUSTIBLE INSULATING MATERIALS^m**

STRUCTURAL PARTS TO BE PROTECTED	ITEM NUMBER	INSULATING MATERIAL USED	MINIMUM THICKNESS OF INSULATING MATERIAL FOR THE FOLLOWING FIRE-RESISTANCE PERIODS (inches)			
			4 hour	3 hour	2 hour	1 hour
5. Reinforcing steel in reinforced concrete columns, beams girders and trusses	5-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete, members 12" or larger, square or round. (Size limit does not apply to beams and girders monolithic with floors.)	1 1/2	1 1/2	1 1/2	1 1/2
		Siliceous aggregate concrete, members 12" or larger, square or round. (Size limit does not apply to beams and girders monolithic with floors.)	2	1 1/2	1 1/2	1 1/2
6. Reinforcing steel in reinforced concrete joists ^l	6-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete.	1 1/4	1 1/4	1	3/4
	6-1.2	Siliceous aggregate concrete.	1 3/4	1 1/2	1	3/4
7. Reinforcing and tie rods in floor and roof slabs ^l	7-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete.	1	1	3/4	3/4
	7-1.2	Siliceous aggregate concrete.	1 1/4	1	1	3/4

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm², 1 cubic foot = 0.0283 m³.

- a. Reentrant parts of protected members to be filled solidly.
- b. Two layers of equal thickness with a 3/4-inch airspace between.
- c. For all of the construction with gypsum wallboard described in Table 720.1(1), gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided attachment is identical to that specified for the wallboard and the joints on the face layer are reinforced, and the entire surface is covered with a minimum of 1/16-inch gypsum veneer plaster.
- d. An approved adhesive qualified under ASTM E 119.
- e. Where lightweight or sand-lightweight concrete having an oven-dry weight of 110 pounds per cubic foot or less is used, the tabulated minimum cover shall be permitted to be reduced 25 percent, except that in no case shall the cover be less than 3/4 inch in slabs or 1 1/2 inches in beams or girders.
- f. For solid slabs of siliceous aggregate concrete, increase tendon cover 20 percent.
- g. Adequate provisions against spalling shall be provided by U-shaped or hooped stirrups spaced not to exceed the depth of the member with a clear cover of 1 inch.
- h. Prestressed slabs shall have a thickness not less than that required in Table 720.1(3) for the respective fire resistance time period.
- i. Fire coverage and end anchorages shall be as follows: Cover to the prestressing steel at the anchor shall be 1/2 inch greater than that required away from the anchor. Minimum cover to steel-bearing plate shall be 1 inch in beams and 3/4 inch in slabs.
- j. For beam widths between 8 inches and 12 inches, cover thickness shall be permitted to be determined by interpolation.
- k. Interior spans of continuous slabs, beams and girders shall be permitted to be considered restrained.
- l. For use with concrete slabs having a comparable fire endurance where members are framed into the structure in such a manner as to provide equivalent performance to that of monolithic concrete construction.
- m. Generic fire-resistance ratings (those not designated as PROPRIETARY* in the listing) in GA 600 shall be accepted as if herein listed.
- n. No additional insulating material is required on the exposed outside face of the column flange to achieve a 1-hour fire-resistance rating.

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TABLE 720.1(2)
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS ^{a,o,p}

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE ^b (inches)			
			4 hour	3 hour	2 hour	1 hour
1. Brick of clay or shale	1-1.1	Solid brick of clay or shale ^c	6	4.9	3.8	2.7
	1-1.2	Hollow brick, not filled.	5.0	4.3	3.4	2.3
	1-1.3	Hollow brick unit wall, grout or filled with perlite vermiculite or expanded shale aggregate.	6.6	5.5	4.4	3.0
	1-2.1	4" nominal thick units at least 75 percent solid backed with a hat-shaped metal furring channel ³ / ₄ " thick formed from 0.021" sheet metal attached to the brick wall on 24" centers with approved fasteners, and ¹ / ₂ " Type X gypsum wallboard attached to the metal furring strips with 1"-long Type S screws spaced 8" on center.	—	—	5 ^d	—
2. Combination of clay brick and load-bearing hollow clay tile	2-1.1	4" solid brick and 4" tile (at least 40 percent solid).	—	8	—	—
	2-1.2	4" solid brick and 8" tile (at least 40 percent solid).	12	—	—	—
3. Concrete masonry units	3-1.1 ^{f,g}	Expanded slag or pumice.	4.7	4.0	3.2	2.1
	3-1.2 ^{f,g}	Expanded clay, shale or slate.	5.1	4.4	3.6	2.6
	3-1.3 ^f	Limestone, cinders or air-cooled slag.	5.9	5.0	4.0	2.7
	3-1.4 ^{f,g}	Calcareous or siliceous gravel.	6.2	5.3	4.2	2.8
4. Solid concrete ^{h,i}	4-1.1	Siliceous aggregate concrete.	7.0	6.2	5.0	3.5
		Carbonate aggregate concrete.	6.6	5.7	4.6	3.2
		Sand-lightweight concrete.	5.4	4.6	3.8	2.7
		Lightweight concrete.	5.1	4.4	3.6	2.5
5. Glazed or unglazed facing tile, nonload-bearing	5-1.1	One 2" unit cored 15 percent maximum and one 4" unit cored 25 percent maximum with ³ / ₄ " mortar-filled collar joint. Unit positions reversed in alternate courses.	—	6 ³ / ₈	—	—
	5-1.2	One 2" unit cored 15 percent maximum and one 4" unit cored 40 percent maximum with ³ / ₄ " mortar-filled collar joint. Unit positions side with ³ / ₄ " gypsum plaster. Two wythes tied together every fourth course with No. 22 gage corrugated metal ties.	—	6 ³ / ₄	—	—
	5-1.3	One unit with three cells in wall thickness, cored 29 percent maximum.	—	—	6	—
	5-1.4	One 2" unit cored 22 percent maximum and one 4" unit cored 41 percent maximum with ¹ / ₄ " mortar-filled collar joint. Two wythes tied together every third course with 0.030" (No. 22 galvanized sheet steel gage) corrugated metal ties.	—	—	6	—
	5-1.5	One 4" unit cored 25 percent maximum with ³ / ₄ " gypsum plaster on one side.	—	—	4 ³ / ₄	—
	5-1.6	One 4" unit with two cells in wall thickness, cored 22 percent maximum.	—	—	—	4
	5-1.7	One 4" unit cored 30 percent maximum with ³ / ₄ " vermiculite gypsum plaster on one side.	—	—	4 ¹ / ₂	—
	5-1.8	One 4" unit cored 39 percent maximum with ³ / ₄ " gypsum plaster on one side.	—	—	—	4 ¹ / ₂

(continued)

TABLE 720.1(2)—continued
 RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS ^{a,o,p}

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE ^b (inches)			
			4 hour	3 hour	2 hour	1 hour
6. Solid gypsum plaster	6-1.1	$\frac{3}{4}$ " by 0.055" (No. 16 carbon sheet steel gage) vertical cold-rolled channels, 16" on center with 2.6-pound flat metal lath applied to one face and tied with 0.049" (No. 18 B.W. Gage) wire at 6" spacing. Gypsum plaster each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	2 ^d
	6-1.2	$\frac{3}{4}$ " by 0.05" (No. 16 carbon sheet steel gage) cold-rolled channels 16" on center with metal lath applied to one face and tied with 0.049" (No. 18 B.W. gage) wire at 6" spacing. Perlite or vermiculite gypsum plaster each side. For three-coat work, the plaster mix for the second coat shall not exceed 100 pounds of gypsum to 2 $\frac{1}{2}$ cubic feet of aggregate for the 1-hour system.	—	—	2 $\frac{1}{2}$ ^d	2 ^d
	6-1.3	$\frac{3}{4}$ " by 0.055" (No. 16 carbon sheet steel gage) vertical cold-rolled channels, 16" on center with $\frac{3}{8}$ " gypsum lath applied to one face and attached with sheet metal clips. Gypsum plaster each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	2 ^d
	6-2.1	Studless with $\frac{1}{2}$ " full-length plain gypsum lath and gypsum plaster each side. Plaster mixed 1:1 for scratch coat and 1:2 for brown coat, by weight, gypsum to sand aggregate.	—	—	—	2 ^d
	6-2.2	Studless with $\frac{1}{2}$ " full-length plain gypsum lath and perlite or vermiculite gypsum plaster each side.	—	—	2 $\frac{1}{2}$ ^d	2 ^d
	6-2.3	Studless partition with $\frac{3}{8}$ " rib metal lath installed vertically adjacent edges tied 6" on center with No. 18 gage wire ties, gypsum plaster each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	2 ^d
7. Solid perlite and portland cement	7-1.1	Perlite mixed in the ratio of 3 cubic feet to 100 pounds of portland cement and machine applied to stud side of 1 $\frac{1}{2}$ " mesh by 0.058-inch (No. 17 B.W. gage) paper-backed woven wire fabric lath wire-tied to 4"-deep steel trussed wire studs 16" on center. Wire ties of 0.049" (No. 18 B.W. gage) galvanized steel wire 6" on center vertically.	—	—	3 $\frac{1}{8}$ ^d	—
8. Solid neat wood fibered gypsum plaster	8-1.1	$\frac{3}{4}$ " by 0.055-inch (No. 16 carbon sheet steel gage) cold-rolled channels, 12" on center with 2.5-pound flat metal lath applied to one face and tied with 0.049" (No. 18 B.W. gage) wire at 6" spacing. Neat gypsum plaster applied each side.	—	—	2 ^d	—
9. Solid wallboard partition	9-1.1	One full-length layer $\frac{1}{2}$ " Type X gypsum wallboard ^c laminated to each side of 1" full-length V-edge gypsum coreboard with approved laminating compound. Vertical joints of face layer and coreboard staggered at least 3".	—	—	2 ^d	—
10. Hollow (studless) gypsum wallboard partition	10-1.1	One full-length layer of $\frac{5}{8}$ " Type X gypsum wallboard ^c attached to both sides of wood or metal top and bottom runners laminated to each side of 1" \times 6" full-length gypsum coreboard ribs spaced 2" on center with approved laminating compound. Ribs centered at vertical joints of face plies and joints staggered 24" in opposing faces. Ribs may be recessed 6" from the top and bottom.	—	—	—	2 $\frac{1}{4}$ ^d
	10-1.2	1" regular gypsum V-edge full-length backing board attached to both sides of wood or metal top and bottom runners with nails or 1 $\frac{5}{8}$ " drywall screws at 24" on center. Minimum width of runners 1 $\frac{5}{8}$ ". Face layer of $\frac{1}{2}$ " regular full-length gypsum wallboard laminated to outer faces of backing board with approved laminating compound.	—	—	4 $\frac{5}{8}$ ^d	—

(continued)

TABLE 720.1(2)—continued
 RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS a,o,p

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE ^b (inches)			
			4 hour	3 hour	2 hour	1 hour
11. Noncombustible studs—interior partition with plaster each side	11-1.1	3 ¹ / ₄ " × 0.044" (No. 18 carbon sheet steel gage) steel studs spaced 24" on center. 5 ⁵ / ₈ " gypsum plaster on metal lath each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	4 ³ / ₄ ^d
	11-1.2	3 ³ / ₈ " × 0.055" (No. 16 carbon sheet steel gage) approved nailable ^k studs spaced 24" on center. 5 ⁵ / ₈ " neat gypsum wood-fibered plaster each side over 3 ³ / ₈ " rib metal lath nailed to studs with 6d common nails, 8" on center. Nails driven 1 ¹ / ₄ " and bent over.	—	—	5 ⁵ / ₈	—
	11-1.3	4" × 0.044" (No. 18 carbon sheet steel gage) channel-shaped steel studs at 16" on center. On each side approved resilient clips pressed onto stud flange at 16" vertical spacing, 1 ¹ / ₄ " pencil rods snapped into or wire tied onto outer loop of clips, metal lath wire-tied to pencil rods at 6" intervals, 1" perlite gypsum plaster, each side.	—	7 ⁵ / ₈ ^d	—	—
	11-1.4	2 ¹ / ₂ " × 0.044" (No. 18 carbon sheet steel gage) steel studs spaced 16" on center. Wood fibered gypsum plaster mixed 1:1 by weight gypsum to sand aggregate applied on 3 ³ / ₄ "-pound metal lath wire tied to studs, each side. 3 ³ / ₄ " plaster applied over each face, including finish coat.	—	—	4 ¹ / ₄ ^d	—
12. Wood studs interior partition with plaster each side	12-1.1 ^m	2" × 4" wood studs 16" on center with 5 ⁵ / ₈ " gypsum plaster on metal lath. Lath attached by 4d common nails bent over or No. 14 gage by 1 ¹ / ₄ " by 3 ³ / ₄ " crown width staples spaced 6" on center. Plaster mixed 1:1 ¹ / ₂ for scratch coat and 1:3 for brown coat, by weight, gypsum to sand aggregate.	—	—	—	5 ¹ / ₈
	12-1.2 ¹	2" × 4" wood studs 16" on center with metal lath and 7 ⁷ / ₈ " neat wood-fibered gypsum plaster each side. Lath attached by 6d common nails, 7" on center. Nails driven 1 ¹ / ₄ " and bent over.	—	—	5 ¹ / ₂ ^d	—
	12-1.3 ¹	2" × 4" wood studs 16" on center with 3 ³ / ₈ " perforated or plain gypsum lath and 1 ¹ / ₂ " gypsum plaster each side. Lath nailed with 1 ¹ / ₈ " by No. 13 gage by 1 ¹⁹ / ₆₄ " head plasterboard blued nails, 4" on center. Plaster mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	5 ¹ / ₄
	12-1.4 ¹	2" × 4" wood studs 16" on center with 3 ³ / ₈ " Type X gypsum lath and 1 ¹ / ₂ " gypsum plaster each side. Lath nailed with 1 ¹ / ₈ " by No. 13 gage by 1 ¹⁹ / ₆₄ " head plasterboard blued nails, 5" on center. Plaster mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	5 ¹ / ₄
13. Noncombustible studs—interior partition with gypsum wallboard each side	13-1.1	0.018" (No. 25 carbon sheet steel gage) channel-shaped studs 24" on center with one full-length layer of 3 ³ / ₈ " Type X gypsum wallboard ^e applied vertically attached with 1" long No. 6 drywall screws to each stud. Screws are 8" on center around the perimeter and 12" on center on the intermediate stud. The wallboard may be applied horizontally when attached to 3 ³ / ₈ " studs and the horizontal joints are staggered with those on the opposite side. Screws for the horizontal application shall be 8" on center at vertical edges and 12" on center at intermediate studs.	—	—	—	2 ⁷ / ₈ ^d
	13-1.2	0.018" (No. 25 carbon sheet steel gage) channel-shaped studs 25" on center with two full-length layers of 1 ¹ / ₂ " Type X gypsum wallboard ^e applied vertically each side. First layer attached with 1"-long, No. 6 drywall screws, 8" on center around the perimeter and 12" on center on the intermediate stud. Second layer applied with vertical joints offset one stud space from first layer using 1 ⁵ / ₈ " long, No. 6 drywall screws spaced 9" on center along vertical joints, 12" on center at intermediate studs and 24" on center along top and bottom runners.	—	—	3 ⁵ / ₈ ^d	—
	13-1.3	0.055" (No. 16 carbon sheet steel gage) approved nailable metal studs ^e 24" on center with full-length 5 ⁵ / ₈ " Type X gypsum wallboard ^e applied vertically and nailed 7" on center with 6d cement-coated common nails. Approved metal fastener grips used with nails at vertical butt joints along studs.	—	—	—	4 ⁷ / ₈

(continued)

TABLE 720.1(2)—continued
 RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS a,o,p

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE ^b (inches)			
			4 hour	3 hour	2 hour	1 hour
14. Wood studs—interior partition with gypsum wallboard each side	14-1.1 ^{h,m}	2" × 4" wood studs 16" on center with two layers of 3/8" regular gypsum wallboard ^c each side, 4d cooler ⁿ or wallboard ⁿ nails at 8" on center first layer, 5d cooler ⁿ or wallboard ⁿ nails at 8" on center second layer with laminating compound between layers, joints staggered. First layer applied full length vertically, second layer applied horizontally or vertically	—	—	—	5
	14-1.2 ^{l,m}	2" × 4" wood studs 16" on center with two layers 1/2" regular gypsum wallboard ^c applied vertically or horizontally each side ^k , joints staggered. Nail base layer with 5d cooler ⁿ or wallboard ⁿ nails at 8" on center face layer with 8d cooler ⁿ or wallboard ⁿ nails at 8" on center.	—	—	—	5 1/2
	14-1.3 ^{l,m}	2" × 4" wood studs 24" on center with 5/8" Type X gypsum wallboard ^c applied vertically or horizontally nailed with 6d cooler ⁿ or wallboard ⁿ nails at 7" on center with end joints on nailing members. Stagger joints each side.	—	—	—	4 3/4
	14-1.4 ^l	2" × 4" fire-retardant-treated wood studs spaced 24" on center with one layer of 5/8" Type X gypsum wallboard ^c applied with face paper grain (long dimension) parallel to studs. Wallboard attached with 6d cooler ⁿ or wallboard ⁿ nails at 7" on center.	—	—	—	4 3/4 ^d
	14-1.5 ^{l,m}	2" × 4" wood studs 1" on center with two layers 5/8" Type X gypsum wallboard ^c each side. Base layers applied vertically and nailed with 6d cooler ⁿ or wallboard ⁿ nails at 9" on center. Face layer applied vertically or horizontally and nailed with 8d cooler ⁿ or wallboard ⁿ nails at 7" on center. For nail-adhesive application, base layers are nailed 6" on center. Face layers applied with coating of approved wallboard adhesive and nailed 12" on center.	—	—	6	—
	14-1.6 ^l	2" × 3" fire-retardant-treated wood studs spaced 24" on center with one layer of 5/8" Type X gypsum wallboard ^c applied with face paper grain (long dimension) at right angles to studs. Wallboard attached with 6d cement-coated box nails spaced 7" on center.	—	—	—	3 5/8 ^d
15. Exterior or interior walls	15-1.1 ^{l,m}	Exterior surface with 3/4" drop siding over 1/2" gypsum sheathing on 2" × 4" wood studs at 16" on center, interior surface treatment as required for 1-hour-rated exterior or interior 2" × 4" wood stud partitions. Gypsum sheathing nailed with 1 3/4" by No. 11 gage by 7/16" head galvanized nails at 8" on center. Siding nailed with 7d galvanized smooth box nails.	—	—	—	Varies
	15-1.2 ^{l,m}	2" × 4" wood studs 16" on center with metal lath and 3/4" cement plaster on each side. Lath attached with 6d common nails 7" on center driven to 1" minimum penetration and bent over. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	5 3/8
	15-1.3 ^{l,m}	2" × 4" wood studs 16" on center with 7/8" cement plaster (measured from the face of studs) on the exterior surface with interior surface treatment as required for interior wood stud partitions in this table. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	Varies
	15-1.4	3 5/8" No. 16 gage noncombustible studs 16" on center with 7/8" cement plaster (measured from the face of the studs) on the exterior surface with interior surface treatment as required for interior, nonbearing, noncombustible stud partitions in this table. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	Varies ^d

(continued)

TABLE 720.1(2)—continued
 RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS a,o,p

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE ^b (inches)			
			4 hour	3 hour	2 hour	1 hour
15. Exterior or interior walls (continued)	15-1.5 ^m	2 ¹ / ₄ " × 3 ³ / ₄ " clay face brick with cored holes over 1/2" gypsum sheathing on exterior surface of 2" × 4" wood studs at 16" on center and two layers 5/8" Type X gypsum wallboard ^c on interior surface. Sheathing placed horizontally or vertically with vertical joints over studs nailed 6" on center with 1 ³ / ₄ " × No. 11 gage by 7/16" head galvanized nails. Inner layer of wallboard placed horizontally or vertically and nailed 8" on center with 6d cooler ⁿ or wallboard ⁿ nails. Outer layer of wallboard placed horizontally or vertically and nailed 8" on center with 8d cooler ⁿ or wallboard ⁿ nails. All joints staggered with vertical joints over studs. Outer layer joints taped and finished with compound. Nail heads covered with joint compound. 0.035 inch (No. 20 galvanized sheet gage) corrugated galvanized steel wall ties 3/4" by 6 ⁵ / ₈ " attached to each stud with two 8d cooler ⁿ or wallboard ⁿ nails every sixth course of bricks.	—	—	10	—
	15-1.6 ^{l,m}	2" × 6" fire-retardant-treated wood studs 16" on center. Interior face has two layers of 5/8" Type X gypsum with the base layer placed vertically and attached with 6d box nails 12" on center. The face layer is placed horizontally and attached with 8d box nails 8" on center at joints and 12" on center elsewhere. The exterior face has a base layer of 5/8" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by self-furred exterior lath attached with 2 ¹ / ₂ ", No. 12 gage galvanized roofing nails with a 3/8" diameter head and spaced 6" on center along each stud. Cement plaster consisting of a 1/2" brown coat is then applied. The scratch coat is mixed in the proportion of 1:3 by weight, cement to sand with 10 pounds of hydrated lime and 3 pounds of approved additives or admixtures per sack of cement. The brown coat is mixed in the proportion of 1:4 by weight, cement to sand with the same amounts of hydrated lime and approved additives or admixtures used in the scratch coat.	—	—	8 ¹ / ₄	—
	15-1.7 ^{l,m}	2" × 6" wood studs 16" on center. The exterior face has a layer of 5/8" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by 1" by No. 18 gage self-furred exterior lath attached with 8d by 2 ¹ / ₂ " long galvanized roofing nails spaced 6" on center along each stud. Cement plaster consisting of a 1/2" scratch coat, a bonding agent and a 1/2" brown coat and a finish coat is then applied. The scratch coat is mixed in the proportion of 1:3 by weight, cement to sand with 10 pounds of hydrated lime and 3 pounds of approved additives or admixtures per sack of cement. The brown coat is mixed in the proportion of 1:4 by weight, cement to sand with the same amounts of hydrated lime and approved additives or admixtures used in the scratch coat. The interior is covered with 3/8" gypsum lath with 1" hexagonal mesh of 0.035 inch (No. 20 B.W. gage) woven wire lath furred out 5/16" and 1" perlite or vermiculite gypsum plaster. Lath nailed with 1 ¹ / ₈ " by No. 13 gage by 19/64" head plasterboard glued nails spaced 5" on center. Mesh attached by 1 ³ / ₄ " by No. 12 gage by 3/8" head nails with 3/8" furrings, spaced 8" on center. The plaster mix shall not exceed 100 pounds of gypsum to 2 ¹ / ₂ cubic feet of aggregate.	—	—	8 ³ / ₈	—
	15-1.8 ^{l,m}	2" × 6" wood studs 16" on center. The exterior face has a layer of 5/8" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by 1 ¹ / ₂ " by No. 17 gage self-furred exterior lath attached with 8d by 2 ¹ / ₂ " long galvanized roofing nails spaced 6" on center along each stud. Cement plaster consisting of a 1/2" scratch coat, and a 1/2" brown coat is then applied. The plaster may be placed by machine. The scratch coat is mixed in the proportion of 1:4 by weight, plastic cement to sand. The brown coat is mixed in the proportion of 1:5 by weight, plastic cement to sand. The interior is covered with 3/8" gypsum lath with 1" hexagonal mesh of No. 20 gage woven wire lath furred out 5/16" and 1" perlite or vermiculite gypsum plaster. Lath nailed with 1 ¹ / ₈ " by No. 13 gage by 19/64" head plasterboard glued nails spaced 5" on center. Mesh attached by 1 ³ / ₄ " by No. 12 gage by 3/8" head nails with 3/8" furrings, spaced 8" on center. The plaster mix shall not exceed 100 pounds of gypsum to 2 ¹ / ₂ cubic feet of aggregate.	—	—	8 ³ / ₈	—

(continued)

TABLE 720.1(2)—continued
 RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS a,o,p

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE ^b (inches)			
			4 hour	3 hour	2 hour	1 hour
15. Exterior or interior walls (continued)	15-1.9	4" No. 18 gage, nonload-bearing metal studs, 16" on center, with 1" portland cement lime plaster [measured from the back side of the 3/4-pound expanded metal lath] on the exterior surface. Interior surface to be covered with 1" of gypsum plaster on 3/4-pound expanded metal lath proportioned by weight—1:2 for scratch coat, 1:3 for brown, gypsum to sand. Lath on one side of the partition fastened to 1/4" diameter pencil rods supported by No. 20 gage metal clips, located 16" on center vertically, on each stud. 3" thick mineral fiber insulating batts friction fitted between the studs.	—	—	6 1/2 ^d	—
	15-1.10	Steel studs 0.060" thick, 4" deep or 6" at 16" or 24" centers, with 1/2" Glass Fiber Reinforced Concrete (GFRC) on the exterior surface. GFRC is attached with flex anchors at 24" on center, with 5" leg welded to studs with two 1/2"-long flare-bevel welds, and 4" foot attached to the GFRC skin with 5/8" thick GFRC bonding pads that extend 2 1/2" beyond the flex anchor foot on both sides. Interior surface to have two layers of 1/2" Type X gypsum wallboard. ^e The first layer of wallboard to be attached with 1"-long Type S buglehead screws spaced 24" on center and the second layer is attached with 1 5/8"-long Type S screws spaced at 12" on center. Cavity is to be filled with 5" of 4 pcf (nominal) mineral fiber batts. GFRC has 1 1/2" returns packed with mineral fiber and caulked on the exterior.	—	—	6 1/2	—
	15-1.11	Steel studs 0.060" thick, 4" deep or 6" at 16" or 24" centers, respectively, with 1/2" Glass Fiber Reinforced Concrete (GFRC) on the exterior surface. GFRC is attached with flex anchors at 24" on center, with 5" leg welded to studs with two 1/2"-long flare-bevel welds, and 4" foot attached to the GFRC skin with 5/8"-thick GFRC bonding pads that extend 2 1/2" beyond the flex anchor foot on both sides. Interior surface to have one layer of 5/8" Type X gypsum wallboard ^e , attached with 1 1/4"-long Type S buglehead screws spaced 12" on center. Cavity is to be filled with 5" of 4 pcf (nominal) mineral fiber batts. GFRC has 1 1/2" returns packed with mineral fiber and caulked on the exterior.	—	—	—	6 1/8
	15-1.12 ^q	2" x 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with 5/8" Type X gypsum wallboard, 4' wide, applied horizontally or vertically with vertical joints over studs, and fastened with 2 1/4" Type S drywall screws, spaced 12" on center.	—	—	—	6 3/4
	15-1.13 ^q	2" x 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with 5/8" Type X gypsum wallboard, 4' wide, applied vertically with all joints over framing or blocking and fastened with 2 1/4" Type S drywall screws, spaced 12" on center. R-19 fiberglass insulation installed in stud cavity.	—	—	—	6 3/4
	15-1.14 ^q	2" x 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with 5/8" Type X gypsum wallboard, 4' wide, applied horizontally or vertically with vertical joints over studs, and fastened with 2 1/4" Type S drywall screws, spaced 7" on center.	—	—	—	6 3/4
	15-1.15 ^q	2" x 4" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with 5/8" Type X gypsum wallboard and sheathing, respectively, 4' wide, applied horizontally or vertically with vertical joints over studs, and fastened with 2 1/4" Type S drywall screws, spaced 12" on center. Cavity to be filled with 3 1/2" mineral wool insulation.	—	—	—	4 3/4
	15-1.16 ^q	2" x 6" wood studs at 24" centers with double top plates, single bottom plate; interior and exterior side covered with two layers of 5/8" Type X gypsum wallboard, 4' wide, applied horizontally with vertical joints over studs. Base layer fastened with 2 1/4" Type S drywall screws, spaced 8" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound. Cavity to be filled with 5 1/2" mineral wool insulation.	—	—	—	4 1/2

(continued)

TABLE 720.1(2)—continued
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS a.o.p

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE ^b (inches)			
			4 hour	3 hour	2 hour	1 hour
16. Exterior walls rated for fire resistance from the inside only in accordance with Section 704.5.	16-1.1 ⁹	2" × 4" wood studs at 16" centers with double top plates, single bottom plate; interior side covered with 5/8" Type X gypsum wallboard, 4' wide, applied horizontally unblocked, and fastened with 2 1/4" Type S drywall screws, spaced 12" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound. Exterior covered with 3/8" wood structural panels, applied vertically, horizontal joints blocked and fastened with 6d common nails (bright) — 12" on center in the field, and 6" on center panel edges. Cavity to be filled with 3 1/2" mineral wool insulation. Rating established for exposure from interior side only.	—	—	—	4 1/2
	16-1.2 ⁹	2" × 6" (51mm x 152 mm) wood studs at 16" centers with double top plates, single bottom plate; interior side covered with 5/8" Type X gypsum wallboard, 4' wide, applied horizontally or vertically with vertical joints over studs and fastened with 2 1/4" Type S drywall screws, spaced 12" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound, exterior side covered with 7/16" wood structural panels fastened with 6d common nails (bright) spaced 12" on center in the field and 6" on center along the panel edges. Cavity to be filled with 5 1/2" mineral wool insulation. Rating established from the gypsum-covered side only.	—	—	—	6 9/16
	16-1.3	2" × 6" wood studs at 16" centers with double top plates, single bottom plates; interior side covered with 5/8" Type X gypsum wallboard, 4' wide, applied vertically with all joints over framing or blocking and fastened with 2 1/4" Type S drywall screws spaced 7" on center. Joints to be covered with tape and joint compound. Exterior covered with 3/8" wood structural panels (oriented strand board), applied vertically with edges over framing or blocking and fastened with 6d common nails (bright) at 12" on center in the field and 6" on center on panel edges. R-19 fiberglass insulation installed in stud cavity.	—	—	—	6 1/2

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm², 1 cubic foot = 0.0283 m³.

- a. Staples with equivalent holding power and penetration shall be permitted to be used as alternate fasteners to nails for attachment to wood framing.
- b. Thickness shown for brick and clay tile is nominal thicknesses unless plastered, in which case thicknesses are net. Thickness shown for concrete masonry and clay masonry is equivalent thickness defined in Section 721.3.1 for concrete masonry and Section 721.4.1.1 for clay masonry. Where all cells are solid grouted or filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, the equivalent thickness shall be the thickness of the block or brick using specified dimensions as defined in Chapter 21. Equivalent thickness may also include the thickness of applied plaster and lath or gypsum wallboard, where specified.
- c. For units in which the net cross-sectional area of cored brick in any plane parallel to the surface containing the cores is at least 75 percent of the gross cross-sectional area measured in the same plane.
- d. Shall be used for nonbearing purposes only.
- e. For all of the construction with gypsum wallboard described in this table, gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided attachment is identical to that specified for the wallboard, and the joints on the face layer are reinforced and the entire surface is covered with a minimum of 1/16-inch gypsum veneer plaster.
- f. The fire-resistance time period for concrete masonry units meeting the equivalent thicknesses required for a 2-hour fire-resistance rating in Item 3, and having a thickness of not less than 7 5/8 inches is 4 hours when cores which are not grouted are filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, sand or slag having a maximum particle size of 3/8 inch.
- g. The fire-resistance rating of concrete masonry units composed of a combination of aggregate types or where plaster is applied directly to the concrete masonry shall be determined in accordance with ACI 216.1/TMS 0216. Lightweight aggregates shall have a maximum combined density of 65 pounds per cubic foot.
- h. See also Note b. The equivalent thickness shall be permitted to include the thickness of cement plaster or 1.5 times the thickness of gypsum plaster applied in accordance with the requirements of Chapter 25.
- i. Concrete walls shall be reinforced with horizontal and vertical temperature reinforcement as required by Chapter 19.
- j. Studs are welded truss wire studs with 0.18 inch (No. 7 B.W. gage) flange wire and 0.18 inch (No. 7 B.W. gage) truss wires.
- k. Nailable metal studs consist of two channel studs spot welded back to back with a crimped web forming a nailing groove.
- l. Wood structural panels shall be permitted to be installed between the fire protection and the wood studs on either the interior or exterior side of the wood frame assemblies in this table, provided the length of the fasteners used to attach the fire protection is increased by an amount at least equal to the thickness of the wood structural panel.
- m. The design stress of studs shall be reduced to 78 percent of allowable F'_c with the maximum not greater than 78 percent of the calculated stress with studs having a slenderness ratio l_e/d of 33.
- n. For properties of cooler or wallboard nails, see ASTM C 514, ASTM C 547 or ASTM F 1667.
- o. Generic fire-resistance ratings (those not designated as PROPRIETARY* in the listing) in the GA 600 shall be accepted as if herein listed.
- p. NCMA TEK 5-8A shall be permitted for the design of fire walls.
- q. The design stress of studs shall be equal to a maximum of 100 percent of the allowable F'_c calculated in accordance with Section 2306.

TABLE 720.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS^{a,q}

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hour	3 hour	2 hour	1 hour	4 hour	3 hour	2 hour	1 hour
1. Siliceous aggregate concrete	1-1.1	Slab (no ceiling required). Minimum cover over nonprestressed reinforcement shall not be less than $\frac{3}{4}$ " ^b .	7.0	6.2	5.0	3.5	—	—	—	—
2. Carbonate aggregate concrete	2-1.1		6.6	5.7	4.6	3.2	—	—	—	—
3. Sand-lightweight concrete	3-1.1		5.4	4.6	3.8	2.7	—	—	—	—
4. Lightweight concrete	4-1.1		5.1	4.4	3.6	2.5	—	—	—	—
5. Reinforced concrete	5-1.1	Slab with suspended ceiling of vermiculite gypsum plaster over metal lath attached to $\frac{3}{4}$ " cold-rolled channels spaced 12" on center. Ceiling located 6" minimum below joists.	3	2	—	—	1	$\frac{3}{4}$	—	—
	5-2.1	$\frac{3}{8}$ " Type X gypsum wallboard ^c attached to 0.018 inch (No. 25 carbon sheet steel gage) by $\frac{7}{8}$ " deep by $2\frac{5}{8}$ " hat-shaped galvanized steel channels with 1"-long No. 6 screws. The channels are spaced 24" on center, span 35" and are supported along their length at 35" intervals by 0.033" (No. 21 galvanized sheet gage) galvanized steel flat strap hangers having formed edges that engage the lips of the channel. The strap hangers are attached to the side of the concrete joists with $\frac{5}{32}$ " by $1\frac{1}{4}$ " long power-driven fasteners. The wallboard is installed with the long dimension perpendicular to the channels. All end joints occur on channels and supplementary channels are installed parallel to the main channels, 12" each side, at end joint occurrences. The finished ceiling is located approximately 12" below the soffit of the floor slab.	—	—	$2\frac{1}{2}$	—	—	—	$\frac{5}{8}$	—
6. Steel joists constructed with a poured reinforced concrete slab on metal lath forms or steel form units ^{d, e}	6-1.1	Gypsum plaster on metal lath attached to the bottom cord with single No. 16 gage or doubled No. 18 gage wire ties spaced 6" on center. Plaster mixed 1:2 for scratch coat, 1:3 for brown coat, by weight, gypsum-to-sand aggregate for 2-hour system. For 3-hour system plaster is neat.	—	—	$2\frac{1}{2}$	$2\frac{1}{4}$	—	—	$\frac{3}{4}$	$\frac{5}{8}$
	6-2.1	Vermiculite gypsum plaster on metal lath attached to the bottom chord with single No.16 gage or doubled 0.049-inch (No. 18 B.W. gage) wire ties 6" on center.	—	2	—	—	—	$\frac{5}{8}$	—	—
	6-3.1	Cement plaster over metal lath attached to the bottom chord of joists with single No. 16 gage or doubled 0.049" (No. 18 B.W. gage) wire ties spaced 6" on center. Plaster mixed 1:2 for scratch coat, 1:3 for brown coat for 1-hour system and 1:1 for scratch coat, 1:1 $\frac{1}{2}$ for brown coat for 2-hour system, by weight, cement to sand.	—	—	—	2	—	—	—	$\frac{5}{8}$ ^f
	6-4.1	Ceiling of $\frac{5}{8}$ " Type X wallboard ^c attached to $\frac{7}{8}$ " deep by $2\frac{5}{8}$ " by 0.021 inch (No. 25 carbon sheet steel gage) hat-shaped furring channels 12" on center with 1" long No. 6 wallboard screws at 8" on center. Channels wire tied to bottom chord of joists with doubled 0.049 inch (No. 18 B.W. gage) wire or suspended below joists on wire hangers. ^g	—	—	$2\frac{1}{2}$	—	—	—	$\frac{5}{8}$	—
	6-5.1	Wood-fibered gypsum plaster mixed 1:1 by weight gypsum to sand aggregate applied over metal lath. Lath tied 6" on center to $\frac{3}{4}$ " channels spaced $13\frac{1}{2}$ " on center. Channels secured to joists at each intersection with two strands of 0.049 inch (No. 18 B.W. gage) galvanized wire.	—	—	$2\frac{1}{2}$	—	—	—	$\frac{3}{4}$	—

(continued)

TABLE 720.1(3)—continued
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS^{a,q}

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hour	3 hour	2 hour	1 hour	4 hour	3 hour	2 hour	1 hour
7. Reinforced concrete slabs and joists with hollow clay tile fillers laid end to end in rows 2½" or more apart; reinforcement placed between rows and concrete cast around and over tile.	7-1.1	5/8" gypsum plaster on bottom of floor or roof construction.	—	—	8 ^h	—	—	—	5/8	—
	7-1.2	None	—	—	—	5½ ⁱ	—	—	—	—
8. Steel joists constructed with a reinforced concrete slab on top poured on a ½" deep steel deck. ^e	8-1.1	Vermiculite gypsum plaster on metal lath attached to ¾" cold-rolled channels with 0.049" (No. 18 B.W. gage) wire ties spaced 6" on center.	2½ ^j	—	—	—	¾	—	—	—
9. 3" deep cellular steel deck with concrete slab on top. Slab thickness measured to top.	9-1.1	Suspended ceiling of vermiculite gypsum plaster base coat and vermiculite acoustical plaster on metal lath attached at 6" intervals to ¾" cold-rolled channels spaced 12" on center and secured to 1½" cold-rolled channels spaced 36" on center with 0.065" (No. 16 B.W. gage) wire. 1½" channels supported by No. 8 gage wire hangers at 36" on center. Beams within envelope and with a 2½" airspace between beam soffit and lath have a 4-hour rating.	2½ ^j	—	—	—	1⅛ ^k	—	—	—
10. 1½"-deep steel roof deck on steel framing. Insulation board, 30 pcf density, composed of wood fibers with cement binders of thickness shown bonded to deck with unified asphalt adhesive. Covered with a Class A or B roof covering.	10-1.1	Ceiling of gypsum plaster on metal lath. Lath attached to ¾" furring channels with 0.049" (No. 18 B.W. gage) wire ties spaced 6" on center. ¾" channel saddle tied to 2" channels with doubled 0.065" (No. 16 B.W. gage) wire ties. 2" channels spaced 36" on center suspended 2" below steel framing and saddle-tied with 0.165" (No. 8 B.W. gage) wire. Plaster mixed 1:2 by weight, gypsum-to-sand aggregate.	—	—	1⅞	1	—	—	¾ ^l	¾ ^l
11. 1½"-deep steel roof deck on steel-framing wood fiber insulation board, 17.5 pcf density on top applied over a 15-lb asphalt-saturated felt. Class A or B roof covering.	11-1.1	Ceiling of gypsum plaster on metal lath. Lath attached to ¾" furring channels with 0.049" (No. 18 B.W. gage) wire ties spaced 6" on center. ¾" channels saddle tied to 2" channels with doubled 0.065" (No. 16 B.W. gage) wire ties. 2" channels spaced 36" on center suspended 2" below steel framing and saddle tied with 0.165" (No. 8 B.W. gage) wire. Plaster mixed 1:2 for scratch coat and 1:3 for brown coat, by weight, gypsum-to-sand aggregate for 1-hour system. For 2-hour system, plaster mix is 1:2 by weight, gypsum-to-sand aggregate.	—	—	1½	1	—	—	7/8 ^g	¾ ^l

(continued)

TABLE 720.1(3)—continued
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS^{a,q}

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hour	3 hour	2 hour	1 hour	4 hour	3 hour	2 hour	1 hour
12. 1 1/2" deep steel roof deck on steel-framing insulation of rigid board consisting of expanded perlite and fibers impregnated with integral asphalt waterproofing; density 9 to 12 pcf secured to metal roof deck by 1/2" wide ribbons of waterproof, cold-process liquid adhesive spaced 6" apart. Steel joist or light steel construction with metal roof deck, insulation, and Class A or B built-up roof covering. ^e	12-1.1	Gypsum-vermiculite plaster on metal lath wire tied at 6" intervals to 3/4" furring channels spaced 12" on center and wire tied to 2" runner channels spaced 32" on center. Runners wire tied to bottom chord of steel joists.	—	—	1	—	—	7/8	—	
	13-1.1	Gypsum plaster over 3/8" Type X gypsum lath. Lath initially applied with not less than four 1 1/8" by No. 13 gage by 19/64" head plasterboard blued nails per bearing. Continuous stripping over lath along all joist lines. Stripping consists of 3" wide strips of metal lath attached by 1 1/2" by No. 11 gage by 1/2" head roofing nails spaced 6" on center. Alternate stripping consists of 3" wide 0.049" diameter wire stripping weighing 1 pound per square yard and attached by No.16 gage by 1 1/2" by 3/4" crown width staples, spaced 4" on center. Where alternate stripping is used, the lath nailing may consist of two nails at each end and one nail at each intermediate bearing. Plaster mixed 1:2 by weight, gypsum-to-sand aggregate.	—	—	—	—	—	—	7/8	
	13-1.2	Cement or gypsum plaster on metal lath. Lath fastened with 1 1/2" by No. 11 gage by 7/16" head barbed shank roofing nails spaced 5" on center. Plaster mixed 1:2 for scratch coat and 1:3 for brown coat, by weight, cement to sand aggregate.	—	—	—	—	—	—	5/8	
	13-1.3	Perlite or vermiculite gypsum plaster on metal lath secured to joists with 1 1/2" by No. 11 gage by 7/16" head barbed shank roofing nails spaced 5" on center.	—	—	—	—	—	—	5/8	
	13-1.4	1/2" Type X gypsum wallboard ^c nailed to joists with 5d cooler ^o or wallboard ^o nails at 6" on center. End joints of wallboard centered on joists.	—	—	—	—	—	—	1/2	
13. Double wood floor over wood joists spaced 16" on center. ^{m,n}	14-1.1	1/2"-thick wood fiberboard weighing 15 to 18 pounds per cubic foot installed with long dimension parallel to stringers or 3/8" C-D (exterior glue) plywood glued and/or nailed to stringers. Nailing to be with 5d cooler ^o or wallboard ^o nails at 12" on center. Second layer of 1/2" Type X gypsum wallboard ^c applied with long dimension perpendicular to joists and attached with 8d cooler ^o or wallboard ^o nails at 6" on center at end joints and 8" on center elsewhere. Wallboard joints staggered with respect to fiberboard joints.	—	—	—	—	—	—	1	

(continued)

TABLE 720.1(3)—continued
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS^{a,q}

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hour	3 hour	2 hour	1 hour	4 hour	3 hour	2 hour	1 hour
15. Vermiculite concrete slab proportioned 1:4 (portland cement to vermiculite aggregate) on a 1½"-deep steel deck supported on individually protected steel framing. Maximum span of deck 6'-10" where deck is less than 0.019 inch (No. 26 carbon steel sheet gage) or greater. Slab reinforced with 4" × 8" 0.109/0.083" (No. 12/14 B.W. gage) welded wire mesh.	15-1.1	None	—	—	—	3 ^j	—	—	—	—
16. Perlite concrete slab proportioned 1:6 (portland cement to perlite aggregate) on a 1¼"-deep steel deck supported on individually protected steel framing. Slab reinforced with 4" × 8" 0.109/0.083" (No. 12/14 B.W. gage) welded wire mesh.	16-1.1	None	—	—	—	3½ ^j	—	—	—	—
17. Perlite concrete slab proportioned 1:6 (portland cement to perlite aggregate) on a 9/16"-deep steel deck supported by steel joists 4' on center. Class A or B roof covering on top.	17-1.1	Perlite gypsum plaster on metal lath wire tied to ¾" furring channels attached with 0.065" (No. 16 B.W. gage) wire ties to lower chord of joists.	—	2 ^p	2 ^p	—	—	7/8	¾	—
18. Perlite concrete slab proportioned 1:6 (portland cement to perlite aggregate) on 1¼"-deep steel deck supported on individually protected steel framing. Maximum span of deck 6'-10" where deck is less than 0.019" (No. 26 carbon sheet steel gage) and 8'-0" where deck is 0.019" (No. 26 carbon sheet steel gage) or greater. Slab reinforced with 0.042" (No. 19 B.W. gage) hexagonal wire mesh. Class A or B roof covering on top.	18-1.1	None	—	2¼ ^p	2¼ ^p	—	—	—	—	—

(continued)

TABLE 720.1(3)—continued
 MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS^{a,9}

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hour	3 hour	2 hour	1 hour	4 hour	3 hour	2 hour	1 hour
19. Floor and beam construction consisting of 3"-deep cellular steel floor unit mounted on steel members with 1:4 (proportion of portland cement to perlite aggregate) perlite-concrete floor slab on top.	19-1.1	Suspended envelope ceiling of perlite gypsum plaster on metal lath attached to 3/4" cold-rolled channels, secured to 1 1/2" cold-rolled channels spaced 42" on center supported by 0.203 inch (No. 6 B.W. gage) wire 36" on center. Beams in envelope with 3" minimum airspace between beam soffit and lath have a 4-hour rating.	2 ^p	—	—	—	1 ¹	—	—	—
20. Perlite concrete proportioned 1:6 (portland cement to perlite aggregate) poured to 1/8" thickness above top of corrugations of 1 5/16"-deep galvanized steel deck maximum span 8'-0" for 0.024" (No. 24 galvanized sheet gage) or 6' 0" for 0.019" (No. 26 galvanized sheet gage) with deck supported by individually protected steel framing. Approved polystyrene foam plastic insulation board having a flame spread not exceeding 75 (1" to 4" thickness) with vent holes that approximate 3 percent of the board surface area placed on top of perlite slurry. A 2' by 4' insulation board contains six 2 3/4" diameter holes. Board covered with 2 1/4" minimum perlite concrete slab.	20-1.1	None	—	—	Varies	—	—	—	—	—

(continued)

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TABLE 720.1(3)—continued
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS^{a,9}

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hour	3 hour	2 hour	1 hour	4 hour	3 hour	2 hour	1 hour
(continued) 20. Slab reinforced with mesh consisting of 0.042" (No. 19 B.W. gage) galvanized steel wire twisted together to form 2" hexagons with straight 0.065" (No. 16 B.W. gage) galvanized steel wire woven into mesh and spaced 3". Alternate slab reinforcement shall be permitted to consist of 4" x 8", 0.109/0.238" (No. 12/4 B.W. gage), or 2" x 2", 0.083/0.083" (No. 14/14 B.W. gage) welded wire fabric. Class A or B roof covering on top.	20-1.1	None	—	—	Varies	—	—	—	—	—
21. Wood joists, wood I-joint, floor trusses and flat or pitched roof trusses spaced a maximum 24" o.c. with 1/2" wood structural panels with exterior glue applied at right angles to top of joist or top chord of trusses with 8d nails. The wood structural panel thickness shall not be less than nominal 1/2" less than required by Chapter 23.	21-1.1	Base layer 5/8" Type X gypsum wallboard applied at right angles to joist or truss 24" o.c. with 1 1/4" Type S or Type W drywall screws 24" o.c. Face layer 5/8" Type X gypsum wallboard or veneer base applied at right angles to joist or truss through base layer with 1 7/8" Type S or Type W drywall screws 12" o.c. at joints and intermediate joist or truss. Face layer Type G drywall screws placed 2" back on either side of face layer end joints, 12" o.c.	—	—	—	Varies	—	—	—	1 1/4
22. Steel joists, floor trusses and flat or pitched roof trusses spaced a maximum 24" o.c. with 1/2" wood structural panels with exterior glue applied at right angles to top of joist or top chord of trusses with No. 8 screws. The wood structural panel thickness shall not be less than nominal 1/2" less than required by Chapter 23.	22-1.1	Base layer 5/8" Type X gypsum board applied at right angles to steel framing 24" on center with 1" Type S drywall screws spaced 24" on center. Face layer 5/8" Type X gypsum board applied at right angles to steel framing attached through base layer with 1 5/8" Type S drywall screws 12" on center at end joints and intermediate joints and 1 1/2" Type G drywall screws 12 inches on center placed 2" back on either side of face layer end joints. Joints of the face layer are offset 24" from the joints of the base layer.	—	—	—	Varies	—	—	—	1 1/4
23. Wood I-joint (minimum joist depth 9 1/4" with a minimum flange depth of 1 5/16" and a minimum flange cross-sectional area of 2.3 square inches) at 24" o.c. spacing with 1 x 4 (nominal) wood furring strip spacer applied parallel to and covering the bottom of the bottom flange of each member, tacked in place. 2" mineral wool insulation, 3.5 pcf (nominal) installed adjacent to the bottom flange of the I-joint and supported by the 1 x 4 furring strip spacer.	23-1.1	1/2" deep single leg resilient channel 16" on center (channels doubled at wallboard end joints), placed perpendicular to the furring strip and joist and attached to each joist by 1 7/8" Type S drywall screws. 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered at least 4' and fastened with 1 1/8" Type S drywall screws spaced 7" on center. Wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	—

(continued)

TABLE 720.1(3)—continued
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS^{a,q}

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hour	3 hour	2 hour	1 hour	4 hour	3 hour	2 hour	1 hour
25. Wood I-joist (minimum I-joist depth 9 ¹ / ₄ " with a minimum flange depth of 1 ¹ / ₂ " and a minimum flange cross-sectional area of 5.25 square inches; minimum web thickness of 3 ³ / ₈ " @ 24" o.c., 1 ¹ / ₂ " mineral fiber insulation (2.5 pcf - nominal) resting on hat-shaped channels.	25-1.1	Minimum 0.026" thick hat-shaped channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by 1 ⁵ / ₈ " Type S drywall screws. 5 ⁵ / ₈ " Type C gypsum wallboard applied perpendicular to the channel with end joints staggered and fastened with 1 ¹ / ₈ " Type S drywall screws spaced 12" o.c. in the field and 8" o.c. at the wallboard ends. Wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	Varies
26. Wood I-joist (minimum I-joist depth 9 ¹ / ₄ " with a minimum flange depth of 1 ¹ / ₂ " and a minimum flange cross-sectional area of 5.25 square inches; minimum web thickness of 7 ¹ / ₁₆ " @ 24" o.c., 1 ¹ / ₂ " mineral fiber insulation (2.5 pcf - nominal) resting on resilient channels.	26-1.1	Minimum 0.019" thick resilient channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by 1 ⁵ / ₈ " Type S drywall screws. 5 ⁵ / ₈ " Type C gypsum wallboard applied perpendicular to the channel with end joints staggered and fastened with 1" Type S drywall screws spaced 12" o.c. in the field and 8" o.c. at the wallboard ends. Wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	Varies
27. Wood I-joist (minimum I-joist depth 9 ¹ / ₄ " with a minimum flange thickness of 1 ¹ / ₂ " and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of 3 ³ / ₈ " @ 24" o.c.	27-1.1	Two layers of 1/2" Type X gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with 1 ⁵ / ₈ " Type S drywall screws spaced 12" o.c. and the face layer is fastened with 2" Type S drywall screws spaced 12" o.c. in the field and 8" o.c. on the edges. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with 1 ¹ / ₂ " Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	Varies
28. Wood I-joist (minimum I-joist depth 9 ¹ / ₂ " with a minimum flange depth of 1 ⁵ / ₁₆ " and a minimum flange cross-sectional area of 1.95 square inches; minimum web thickness of 3 ³ / ₈ " @ 24" o.c.	28-1.1	Minimum 0.019" thick resilient channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by 1 ⁵ / ₈ " Type S drywall screws. Two layers of 1/2" Type X gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with 1 ¹ / ₄ " Type S drywall screws spaced 12" o.c. and the face layer is fastened with 1 ⁵ / ₈ " Type S drywall screws spaced 12" o.c. Face layer end joints shall not occur on the same I-Joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with 1 ¹ / ₂ " Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	Varies

(continued)

TABLE 720.1(3)—continued
 MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS^{a,q}

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hour	3 hour	2 hour	1 hour	4 hour	3 hour	2 hour	1 hour
29. Wood I-joist (minimum I-joist depth 9 ¹ / ₄ " with a minimum flange depth of 1 ¹ / ₂ " and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of 3/8") @ 24" o.c., with hat-shaped channels supporting the middle and face layers of gypsum wallboard. Unfaced fiberglass insulation is installed between the I-joists supported on the upper surface of the flange by stay wires spaced 12" o.c.	29-1.1	Base layer of 5/8" Type C gypsum wallboard attached directly to I-joists with 1 5/8" Type S drywall screws spaced 12" o.c. with ends staggered. Minimum 0.0179" thick resilient channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by 1 5/8" Type S drywall screws after the base layer of gypsum wallboard has been applied. The middle and face layers of 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered. The middle layer is fastened with 1" Type S drywall screws spaced 12" o.c. The face layer is applied parallel to the middle layer but with the edge joints offset 24" from those of the middle layer and fastened with 1 5/8" Type S drywall screws 8" o.c. The joints shall be taped and covered with joint compound.	—	—	—	Varies	—	—	—	Varies
30. Channel-shaped 18 gauge steel joists (minimum depth 8") spaced a maximum 24" o.c. supporting tongue-and-groove wood structural panels (nominal minimum 3/4" thick) applied perpendicular to framing members. Structural panels attached with 1 5/8" Type S-12 screws spaced 12" o.c.	30-1.1	Base layer 5/8" Type X gypsum board applied perpendicular to bottom of framing members with 1 1/8" Type S-12 screws spaced 12" o.c. Second layer 5/8" Type X gypsum board attached perpendicular to framing members with 1 5/8" Type S-12 screws spaced 12" o.c. Second layer joints offset 24" from base layer. Third layer 5/8" Type X gypsum board attached perpendicular to framing members with 2 3/8" Type S-12 screws spaced 12" o.c. Third layer joints offset 12" from second layer joints. Hat-shaped rigid furring channels applied at right angles to framing members over third layer with two 2 3/8" Type S-12 screws at each framing member. Face layer 5/8" Type X gypsum board applied at right angles to furring channels with 1 1/8" Type S screws spaced 12" o.c.	—	—	Varies	—	—	—	3 3/8	—

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Table 720.1(3) Notes.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 0.454 kg, 1 cubic foot = 0.0283 m³,
1 pound per square inch = 6.895 kPa, 1 pound per lineal foot = 1.4882 kg/m.

- a. Staples with equivalent holding power and penetration shall be permitted to be used as alternate fasteners to nails for attachment to wood framing.
- b. When the slab is in an unrestrained condition, minimum reinforcement cover shall not be less than 1⁵/₈ inches for 4-hour (siliceous aggregate only); 1¹/₄ inches for 4- and 3-hour; 1 inch for 2-hour (siliceous aggregate only); and 3/4 inch for all other restrained and unrestrained conditions.
- c. For all of the construction with gypsum wallboard described in this table, gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided attachment is identical to that specified for the wallboard, and the joints on the face layer are reinforced and the entire surface is covered with a minimum of 1/16-inch gypsum veneer plaster.
- d. Slab thickness over steel joists measured at the joists for metal lath form and at the top of the form for steel form units.
- e. (a) The maximum allowable stress level for H-Series joists shall not exceed 22,000 psi.
(b) The allowable stress for K-Series joists shall not exceed 26,000 psi, the nominal depth of such joist shall not be less than 10 inches and the nominal joist weight shall not be less than 5 pounds per lineal foot.
- f. Cement plaster with 15 pounds of hydrated lime and 3 pounds of approved additives or admixtures per bag of cement.
- g. Gypsum wallboard ceilings attached to steel framing shall be permitted to be suspended with 1¹/₂-inch cold-formed carrying channels spaced 48 inches on center, which are suspended with No. 8 SWG galvanized wire hangers spaced 48 inches on center. Cross-furring channels are tied to the carrying channels with No. 18 SWG galvanized wire hangers spaced 48 inches on center. Cross-furring channels are tied to the carrying channels with No. 18 SWG galvanized wire (double strand) and spaced as required for direct attachment to the framing. This alternative is also applicable to those steel framing assemblies recognized under Note q.
- h. Six-inch hollow clay tile with 2-inch concrete slab above.
- i. Four-inch hollow clay tile with 1¹/₂-inch concrete slab above.
- j. Thickness measured to bottom of steel form units.
- k. Five-eighths inch of vermiculite gypsum plaster plus 1/2 inch of approved vermiculite acoustical plastic.
- l. Furring channels spaced 12 inches on center.
- m. Double wood floor shall be permitted to be either of the following:
(a) Subfloor of 1-inch nominal boarding, a layer of asbestos paper weighing not less than 14 pounds per 100 square feet and a layer of 1-inch nominal tongue-and-groove finished flooring; or
(b) Subfloor of 1-inch nominal tongue-and-groove boarding or 15/32-inch wood structural panels with exterior glue and a layer of 1-inch nominal tongue-and-groove finished flooring or 19/32-inch wood structural panel finish flooring or a layer of Type I Grade M-1 particleboard not less than 5/8-inch thick.
- n. The ceiling shall be permitted to be omitted over unusable space, and flooring shall be permitted to be omitted where unusable space occurs above.
- o. For properties of cooler or wallboard nails, see ASTM C 514, ASTM C 547 or ASTM F 1667.
- p. Thickness measured on top of steel deck unit.
- q. Generic fire-resistance ratings (those not designated as PROPRIETARY* in the listing) in the GA 600 shall be accepted as if herein listed.

721.2 Concrete assemblies. The provisions of this section contain procedures by which the fire-resistance ratings of concrete assemblies are established by calculations.

721.2.1 Concrete walls. Cast-in-place and precast concrete walls shall comply with Section 721.2.1.1. Multiwythe concrete walls shall comply with Section 721.2.1.2. Joints between precast panels shall comply with Section 721.2.1.3. Concrete walls with gypsum wallboard or plaster finish shall comply with Section 721.2.1.4.

721.2.1.1 Cast-in-place or precast walls. The minimum equivalent thicknesses of cast-in-place or precast concrete walls for fire-resistance ratings of 1 hour to 4 hours are shown in Table 721.2.1.1. For solid walls with flat vertical surfaces, the equivalent thickness is the same as the actual thickness. The values in Table 721.2.1.1 apply to plain, reinforced or prestressed concrete walls.

**TABLE 721.2.1.1
MINIMUM EQUIVALENT THICKNESS OF CAST-IN-PLACE OR
PRECAST CONCRETE WALLS, LOAD-BEARING OR
NONLOAD-BEARING**

CONCRETE TYPE	MINIMUM SLAB THICKNESS (inches) FOR FIRE-RESISTANCE RATING OF				
	1-hour	1 ¹ / ₂ -hour	2-hour	3-hour	4-hour
Siliceous	3.5	4.3	5.0	6.2	7.0
Carbonate	3.2	4.0	4.6	5.7	6.6
Sand-Lightweight	2.7	3.3	3.8	4.6	5.4
Lightweight	2.5	3.1	3.6	4.4	5.1

For SI: 1 inch = 25.4 mm.

721.2.1.1.1 Hollow-core precast wall panels. For hollow-core precast concrete wall panels in which the cores are of constant cross section throughout the length, calculation of the equivalent thickness by dividing the net cross-sectional area (the gross cross

section minus the area of the cores) of the panel by its width shall be permitted.

721.2.1.1.2 Core spaces filled. Where all of the core spaces of hollow-core wall panels are filled with loose-fill material, such as expanded shale, clay, or slag, or vermiculite or perlite, the fire-resistance rating of the wall is the same as that of a solid wall of the same concrete type and of the same overall thickness.

721.2.1.1.3 Tapered cross sections. The thickness of panels with tapered cross sections shall be that determined at a distance $2t$ or 6 inches (152 mm), whichever is less, from the point of minimum thickness, where t is the minimum thickness.

721.2.1.1.4 Ribbed or undulating surfaces. The equivalent thickness of panels with ribbed or undulating surfaces shall be determined by one of the following expressions:

For $s \geq 4t$, the thickness to be used shall be t

For $s \leq 2t$, the thickness to be used shall be t_e

For $4t > s > 2t$, the thickness to be used shall be

$$t + \left(\frac{4t}{s} - 1 \right) \left(t_e - t \right) \quad \text{(Equation 7-3)}$$

where:

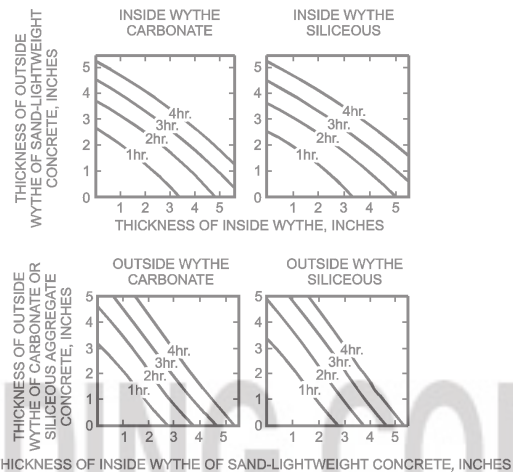
s = Spacing of ribs or undulations.

t = Minimum thickness.

t_e = Equivalent thickness of the panel calculated as the net cross-sectional area of the panel divided by the width, in which the maximum thickness used in the calculation shall not exceed $2t$.

721.2.1.2 Multiwythe walls. For walls that consist of two wythes of different types of concrete, the fire-resis-

tance ratings shall be permitted to be determined from Figure 721.2.1.2.



For SI: 1 inch = 25.4 mm.

**FIGURE 721.2.1.2
FIRE-RESISTANCE RATINGS OF
TWO-WYTHE CONCRETE WALLS**

721.2.1.2.1 Two or more wythes. The fire-resistance rating for wall panels consisting of two or more wythes shall be permitted to be determined by the formula:

$$R = (R_1^{0.59} + R_2^{0.59} + \dots + R_n^{0.59})^{1.7} \quad \text{(Equation 7-4)}$$

where:

R = The fire endurance of the assembly, minutes.

$R_1, R_2,$ and R_n = The fire endurances of the individual wythes, minutes. Values of $R_n^{0.59}$ for use in Equation 7-4 are given in Table 721.2.1.2(1). Calculated fire-resistance ratings are shown in Table 721.2.1.2(2).

**TABLE 721.2.1.2(1)
VALUES OF $R_n^{0.59}$ FOR USE IN EQUATION 7-4**

TYPE OF MATERIAL	THICKNESS OF MATERIAL (inches)											
	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7
Siliceous aggregate concrete	5.3	6.5	8.1	9.5	11.3	13.0	14.9	16.9	18.8	20.7	22.8	25.1
Carbonate aggregate concrete	5.5	7.1	8.9	10.4	12.0	14.0	16.2	18.1	20.3	21.9	24.7	27.2 ^c
Sand-lightweight concrete	6.5	8.2	10.5	12.8	15.5	18.1	20.7	23.3	26.0 ^c	Note c	Note c	Note c
Lightweight concrete	6.6	8.8	11.2	13.7	16.5	19.1	21.9	24.7	27.8 ^c	Note c	Note c	Note c
Insulating concrete ^a	9.3	13.3	16.6	18.3	23.1	26.5 ^c	Note c	Note c	Note c	Note c	Note c	Note c
Airspace ^b	—	—	—	—	—	—	—	—	—	—	—	—

For SI: 1 inch = 25.4 mm, 1 pound per cubic foot = 16.02 kg/m³.

a. Dry unit weight of 35 pcf or less and consisting of cellular, perlite or vermiculite concrete.

b. The $R_n^{0.59}$ value for one ½" to 3 ½" airspace is 3.3. The $R_n^{0.59}$ value for two ½" to 3 ½" airspaces is 6.7.

c. The fire-resistance rating for this thickness exceeds 4 hours.

TABLE 721.2.1.2(2)
FIRE-RESISTANCE RATINGS BASED ON $R^{0.59}$

R^a , MINUTES	$R^{0.59}$
60	11.20
120	16.85
180	21.41
240	25.37

a. Based on Equation 7-4.

721.2.1.2.2 Foam plastic insulation. The fire-resistance ratings of precast concrete wall panels consisting of a layer of foam plastic insulation sandwiched between two wythes of concrete shall be permitted to be determined by use of Equation 7-4. Foam plastic insulation with a total thickness of less than 1 inch (25 mm) shall be disregarded. The R_n value for thickness of foam plastic insulation of 1 inch (25 mm) or greater, for use in the calculation, is 5 minutes; therefore $R_n^{0.59} = 2.5$.

721.2.1.3 Joints between precast wall panels. Joints between precast concrete wall panels which are not insulated as required by this section shall be considered as openings in walls. Uninsulated joints shall be included in determining the percentage of openings permitted by Table 704.8. Where openings are not permitted or are required by this code to be protected, the provisions of this section shall be used to determine the amount of joint insulation required. Insulated joints shall not be considered openings for purposes of determining compliance with the allowable percentage of openings in Table 704.8.

721.2.1.3.1 Ceramic fiber joint protection. Figure 721.2.1.3.1 shows thicknesses of ceramic fiber blankets to be used to insulate joints between precast concrete wall panels for various panel thicknesses and for joint widths of $\frac{3}{8}$ inch (9.5 mm) and 1 inch (25 mm) for fire-resistance ratings of 1 hour to 4 hours. For joint widths between $\frac{3}{8}$ inch (9.5 mm) and 1 inch (25 mm), the thickness of ceramic fiber blanket is allowed

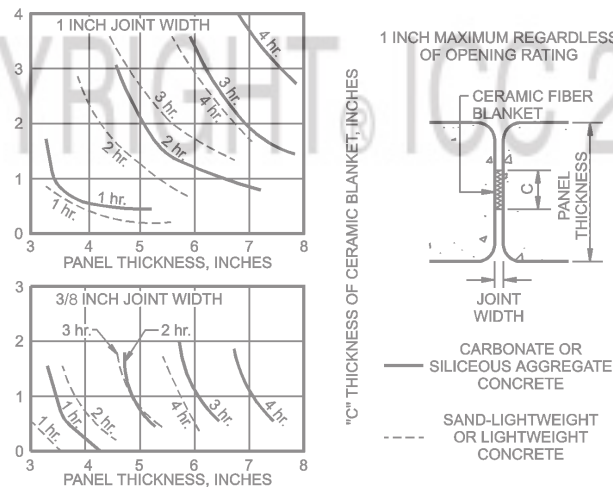
to be determined by direct interpolation. Other tested and labeled materials are acceptable in place of ceramic fiber blankets.

721.2.1.4 Walls with gypsum wallboard or plaster finishes. The fire-resistance rating of cast-in-place or precast concrete walls with finishes of gypsum wallboard or plaster applied to one or both sides shall be permitted to be calculated in accordance with the provisions of this section.

721.2.1.4.1 Nonfire-exposed side. Where the finish of gypsum wallboard or plaster is applied to the side of the wall not exposed to fire, the contribution of the finish to the total fire-resistance rating shall be determined as follows: The thickness of the finish shall first be corrected by multiplying the actual thickness of the finish by the applicable factor determined from Table 721.2.1.4(1) based on the type of aggregate in the concrete. The corrected thickness of finish shall then be added to the actual or equivalent thickness of concrete and fire-resistance rating of the concrete and finish determined from Table 721.2.1.1, Figure 721.2.1.2 or Table 721.2.1.2(1).

721.2.1.4.2 Fire-exposed side. Where gypsum wallboard or plaster is applied to the fire-exposed side of the wall, the contribution of the finish to the total fire-resistance rating shall be determined as follows: The time assigned to the finish as established by Table 721.2.1.4(2) shall be added to the fire-resistance rating determined from Table 721.2.1.1 or Figure 721.2.1.2, or Table 721.2.1.2(1) for the concrete alone, or to the rating determined in Section 721.2.1.4.1 for the concrete and finish on the nonfire-exposed side.

721.2.1.4.3 Nonsymmetrical assemblies. For a wall having no finish on one side or different types or thicknesses of finish on each side, the calculation procedures of Sections 721.2.1.4.1 and 721.2.1.4.2 shall be performed twice, assuming either side of the wall



For SI: 1 inch = 25.4 mm.

FIGURE 721.2.1.3.1
CERAMIC FIBER JOINT PROTECTION

TABLE 721.2.1.4(1)
MULTIPLYING FACTOR FOR FINISHES ON NONFIRE-EXPOSED SIDE OF WALL

TYPE OF FINISH APPLIED TO MASONRY WALL	TYPE OF AGGREGATE USED IN CONCRETE OR CONCRETE MASONRY			
	Concrete: siliceous or carbonate Masonry: siliceous or calcareous gravel	Concrete: sand lightweight concrete Masonry: limestone, cinders or unexpanded slag	Concrete: lightweight concrete Masonry: expanded shale, clay or slate	Concrete: pumice, or expanded slag
Portland cement-sand plaster	1.00	0.75 ^a	0.75 ^a	0.50 ^a
Gypsum-sand plaster or gypsum wallboard	1.25	1.00	1.00	1.00
Gypsum-vermiculite or perlite plaster	1.75	1.50	1.50	1.25

For SI: 1 inch = 25.4 mm.

a. For portland cement-sand plaster ⁵/₈ inch or less in thickness and applied directly to the masonry on the nonfire-exposed side of the wall, the multiplying factor shall be 1.00.

TABLE 721.2.1.4(2)
TIME ASSIGNED TO FINISH MATERIALS ON FIRE-EXPOSED SIDE OF WALL

FINISH DESCRIPTION	TIME (minute)
Gypsum wallboard	
³ / ₈ inch	10
¹ / ₂ inch	15
⁵ / ₈ inch	20
2 layers of ³ / ₈ inch	25
1 layer ³ / ₈ inch, 1 layer ¹ / ₂ inch	35
2 layers ¹ / ₂ inch	40
Type X gypsum wallboard	
¹ / ₂ inch	25
⁵ / ₈ inch	40
Portland cement-sand plaster applied directly to concrete masonry	See Note a
Portland cement-sand plaster on metal lath	
³ / ₄ inch	20
⁷ / ₈ inch	25
1 inch	30
Gypsum sand plaster on ³ / ₈ -inch gypsum lath	
¹ / ₂ inch	35
⁵ / ₈ inch	40
³ / ₄ inch	50
Gypsum sand plaster on metal lath	
³ / ₄ inch	50
⁷ / ₈ inch	60
1 inch	80

For SI: 1 inch = 25.4 mm.

a. The actual thickness of portland cement-sand plaster, provided it is ⁵/₈ inch or less in thickness, shall be permitted to be included in determining the equivalent thickness of the masonry for use in Table 721.3.2.

to be the fire-exposed side. The fire-resistance rating of the wall shall not exceed the lower of the two values.

Exception: For an exterior wall with more than 5 feet (1524 mm) of horizontal separation, the fire shall be assumed to occur on the interior side only.

721.2.1.4.4 Minimum concrete fire-resistance rating. Where finishes applied to one or both sides of a concrete wall contribute to the fire-resistance rating, the concrete alone shall provide not less than one-half of the total required fire-resistance rating. Additionally, the contribution to the fire resistance of the finish on the nonfire-exposed side of a load-bearing wall shall not exceed one-half the contribution of the concrete alone.

721.2.1.4.5 Concrete finishes. Finishes on concrete walls that are assumed to contribute to the total fire-resistance rating of the wall shall comply with the installation requirements of Section 721.3.2.5.

721.2.2 Concrete floor and roof slabs. Reinforced and prestressed floors and roofs shall comply with Section 721.2.2.1. Multicourse floors and roofs shall comply with Sections 721.2.2.2 and 721.2.2.3, respectively.

721.2.2.1 Reinforced and prestressed floors and roofs. The minimum thicknesses of reinforced and prestressed concrete floor or roof slabs for fire-resistance ratings of 1 hour to 4 hours are shown in Table 721.2.2.1.

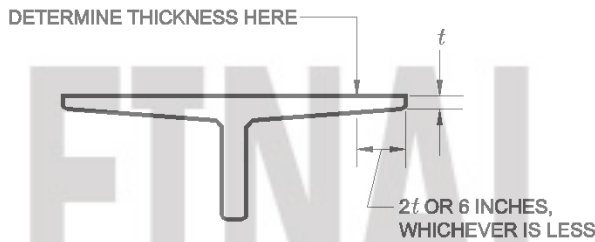
**TABLE 721.2.2.1
MINIMUM SLAB THICKNESS (inches)**

CONCRETE TYPE	FIRE-RESISTANCE RATING (hour)				
	1	1½	2	3	4
Siliceous	3.5	4.3	5.0	6.2	7.0
Carbonate	3.2	4.0	4.6	5.7	6.6
Sand-lightweight	2.7	3.3	3.8	4.6	5.4
Lightweight	2.5	3.1	3.6	4.4	5.1

For SI: 1 inch = 25.4 mm.

721.2.2.1.1 Hollow-core prestressed slabs. For hollow-core prestressed concrete slabs in which the cores are of constant cross section throughout the length, the equivalent thickness shall be permitted to be obtained by dividing the net cross-sectional area of the slab including grout in the joints, by its width.

721.2.2.1.2 Slabs with sloping soffits. The thickness of slabs with sloping soffits (see Figure 721.2.2.1.2) shall be determined at a distance $2t$ or 6 inches (152 mm), whichever is less, from the point of minimum thickness, where t is the minimum thickness.



For SI: 1 inch = 25.4 mm.

**FIGURE 721.2.2.1.2
DETERMINATION OF SLAB THICKNESS
FOR SLOPING SOFFITS**

721.2.2.1.3 Slabs with ribbed soffits. The thickness of slabs with ribbed or undulating soffits (see Figure 721.2.2.1.3) shall be determined by one of the following expressions, whichever is applicable:

For $s > 4t$, the thickness to be used shall be t

For $s \leq 2t$, the thickness to be used shall be t_e

For $4t > s > 2t$, the thickness to be used shall be

$$t + \left(\frac{4t}{s} - 1 \right) (t_e - t) \quad \text{(Equation 7-5)}$$

where:

s = Spacing of ribs or undulations.

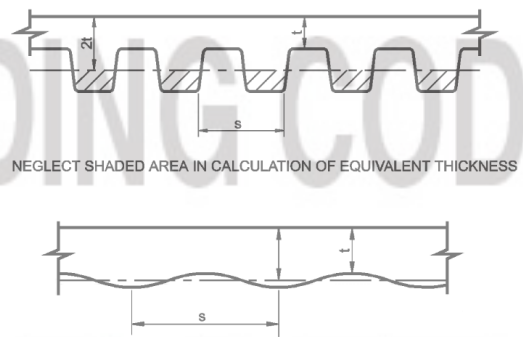
t = Minimum thickness.

t_e = Equivalent thickness of the slab calculated as the net area of the slab divided by the width, in

which the maximum thickness used in the calculation shall not exceed $2t$.

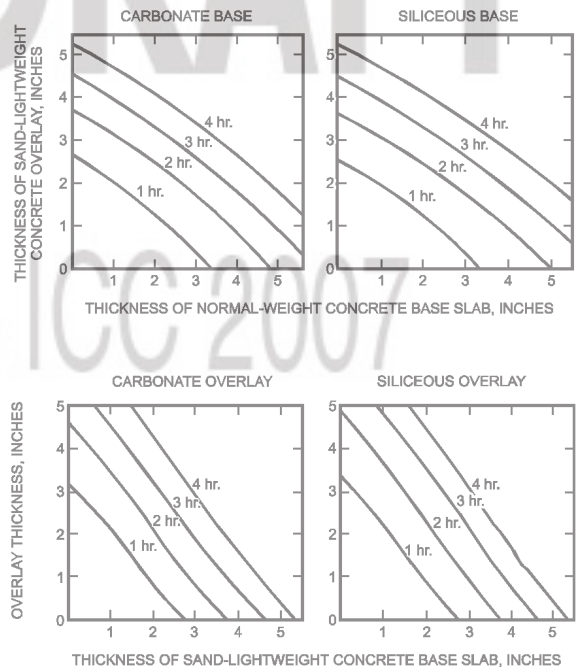
721.2.2.2 Multicourse floors. The fire-resistance ratings of floors that consist of a base slab of concrete with a topping (overlay) of a different type of concrete shall comply with Figure 721.2.2.2.

721.2.2.3 Multicourse roofs. The fire-resistance ratings of roofs which consist of a base slab of concrete with a topping (overlay) of an insulating concrete or with an insulating board and built-up roofing shall comply with Figures 721.2.2.3(1) and 721.2.2.3(2).



For SI: 1 inch = 25.4 mm.

**FIGURE 721.2.2.1.3
SLABS WITH RIBBED OR UNDULATING SOFFITS**



For SI: 1 inch = 25.4 mm.

**FIGURE 721.2.2.2
FIRE-RESISTANCE RATINGS FOR TWO-COURSE
CONCRETE FLOORS**

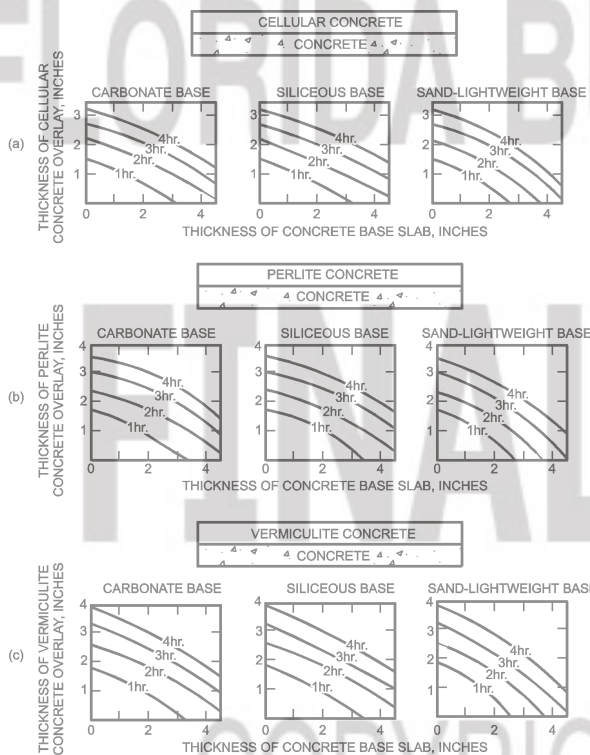
721.2.2.3.1 Heat transfer. For the transfer of heat, three-ply built-up roofing contributes 10 minutes to the fire-resistance rating. The fire-resistance rating for concrete assemblies such as those shown in Figure 721.2.2.3(1) shall be increased by 10 minutes. This increase is not applicable to those shown in Figure 721.2.2.3(2).

721.2.2.4 Joints in precast slabs. Joints between adjacent precast concrete slabs need not be considered in calculating the slab thickness provided that a concrete topping at least 1 inch (25 mm) thick is used. Where no concrete topping is used, joints must be grouted to a depth of at least one-third the slab thickness at the joint,

but not less than 1 inch (25 mm), or the joints must be made fire resistant by other approved methods.

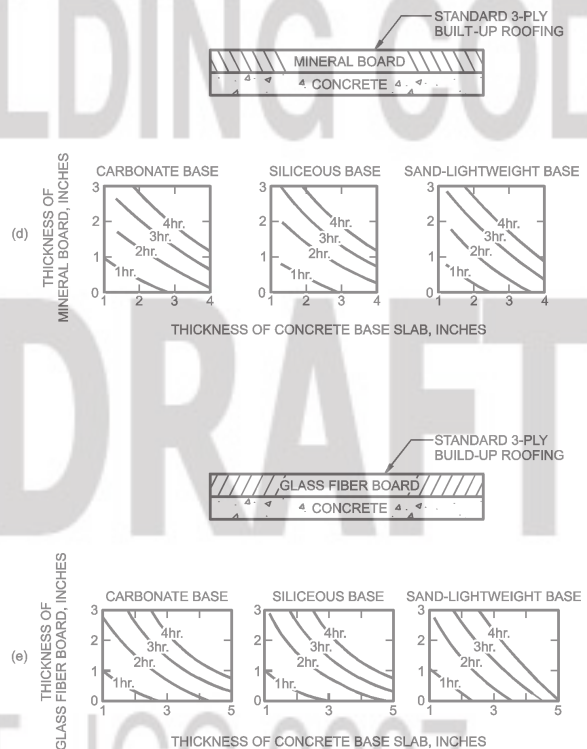
721.2.3 Concrete cover over reinforcement. The minimum thickness of concrete cover over reinforcement in concrete slabs, reinforced beams and prestressed beams shall comply with this section.

721.2.3.1 Slab cover. The minimum thickness of concrete cover to the positive moment reinforcement shall comply with Table 721.2.3(1) for reinforced concrete and Table 721.2.3(2) for prestressed concrete. These tables are applicable for solid or hollow-core one-way or two-way slabs with flat undersurfaces. These tables are applicable to slabs that are either cast in place or precast. For precast prestressed concrete not covered elsewhere,



For SI: 1 inch = 25.4 mm.

FIGURE 721.2.2.3(1)
FIRE-RESISTANCE RATINGS FOR CONCRETE



For SI: 1 inch = 25.4 mm.

FIGURE 721.2.2.3(2)
FIRE-RESISTANCE RATINGS FOR CONCRETE

TABLE 721.2.3(1)
COVER THICKNESS FOR REINFORCED CONCRETE FLOOR OR ROOF SLABS (inches)

CONCRETE AGGREGATE TYPE	FIRE-RESISTANCE RATING (hours)									
	Restrained					Unrestrained				
	1	1½	2	3	4	1	1½	2	3	4
Siliceous	¾	¾	¾	¾	¾	¾	¾	1	1¼	1⅝
Carbonate	¾	¾	¾	¾	¾	¾	¾	¾	1¼	1¼
Sand-lightweight or lightweight	¾	¾	¾	¾	¾	¾	¾	¾	1¼	1¼

For SI: 1 inch = 25.4 mm.

the procedures contained in PCI MNL 124 shall be acceptable.

721.2.3.2 Reinforced beam cover. The minimum thickness of concrete cover to the positive moment reinforcement (bottom steel) for reinforced concrete beams is shown in Table 721.2.3(3) for fire-resistance ratings of 1 hour to 4 hours.

721.2.3.3 Prestressed beam cover. The minimum thickness of concrete cover to the positive moment prestressing tendons (bottom steel) for restrained and unrestrained prestressed concrete beams and stemmed units shall comply with the values shown in Tables 721.2.3(4) and 721.2.3(5) for fire-resistance ratings of 1 hour to 4 hours. Values in Table 721.2.3(4) apply to beams 8 inches (203 mm) or greater in width. Values in Table 721.2.3(5) apply to beams or stems of any width, provided the cross-section area is not less than 40 square inches (25 806 mm²). In case of differences between the values determined from Table 721.2.3(4) or 721.2.3(5), it is permitted to use the smaller value. The concrete cover shall be calculated in accordance with Section 721.2.3.3.1. The minimum concrete cover for

nonprestressed reinforcement in prestressed concrete beams shall comply with Section 721.2.3.2.

721.2.3.3.1 Calculating concrete cover. The concrete cover for an individual tendon is the minimum thickness of concrete between the surface of the tendon and the fire-exposed surface of the beam, except that for ungrouted ducts, the assumed cover thickness is the minimum thickness of concrete between the surface of the duct and the fire-exposed surface of the beam. For beams in which two or more tendons are used, the cover is assumed to be the average of the minimum cover of the individual tendons. For corner tendons (tendons equal distance from the bottom and side), the minimum cover used in the calculation shall be one-half the actual value. For stemmed members with two or more prestressing tendons located along the vertical centerline of the stem, the average cover shall be the distance from the bottom of the member to the centroid of the tendons. The actual cover for any individual tendon shall not be less than one-half the smaller value shown in Tables 721.2.3(4) and 721.2.3(5), or 1 inch (25 mm), whichever is greater.

**TABLE 721.2.3(2)
COVER THICKNESS FOR PRESTRESSED CONCRETE FLOOR OR ROOF SLABS (inches)**

CONCRETE AGGREGATE TYPE	FIRE-RESISTANCE RATING (hours)									
	Restrained					Unrestrained				
	1	1½	2	3	4	1	1½	2	3	4
Siliceous	¾	¾	¾	¾	¾	1⅛	1½	1¾	2⅜	2¾
Carbonate	¾	¾	¾	¾	¾	1	1⅜	1⅝	2⅛	2¼
Sand-lightweight or lightweight	¾	¾	¾	¾	¾	1	1⅜	1½	2	2¼

For SI: 1 inch = 25.4 mm.

**TABLE 721.2.3(3)
MINIMUM COVER FOR MAIN REINFORCING BARS OF REINFORCED CONCRETE BEAMS^c
(APPLICABLE TO ALL TYPES OF STRUCTURAL CONCRETE)**

RESTRAINED OR UNRESTRAINED ^a	BEAM WIDTH ^b (inches)	FIRE-RESISTANCE RATING (hours)				
		1	1½	2	3	4
Restrained	5	¾	¾	¾	1 ^a	1¼ ^a
	7	¾	¾	¾	¾	¾
	≥ 10	¾	¾	¾	¾	¾
Unrestrained	5	¾	1	1¼	—	—
	7	¾	¾	¾	1¾	3
	≥ 10	¾	¾	¾	1	1¾

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- a. Tabulated values for restrained assemblies apply to beams spaced more than 4 feet on center. For restrained beams spaced 4 feet or less on center, minimum cover of ¾ inch is adequate for ratings of 4 hours or less.
- b. For beam widths between the tabulated values, the minimum cover thickness can be determined by direct interpolation.
- c. The cover for an individual reinforcing bar is the minimum thickness of concrete between the surface of the bar and the fire-exposed surface of the beam. For beams in which several bars are used, the cover for corner bars used in the calculation shall be reduced to one-half of the actual value. The cover for an individual bar must be not less than one-half of the value given in Table 721.2.3(3) nor less than ¾ inch.

TABLE 721.2.3(4)
MINIMUM COVER FOR PRESTRESSED CONCRETE BEAMS 8 INCHES OR GREATER IN WIDTH

RESTRAINED OR UNRESTRAINED ^a	CONCRETE AGGREGATE TYPE	BEAM WIDTH ^b (inches)	FIRE-RESISTANCE RATING (hours)				
			1	1½	2	3	4
Restrained	Carbonate or siliceous	8	1½	1½	1½	1¾ ^a	2½ ^a
	Carbonate or siliceous	≥ 12	1½	1½	1½	1½	1¾ ^a
	Sand lightweight	8	1½	1½	1½	1½	2 ^a
	Sand lightweight	≥ 12	1½	1½	1½	1½	1¾ ^a
Unrestrained	Carbonate or siliceous	8	1½	1¾	2½	5 ^c	—
	Carbonate or siliceous	≥ 12	1½	1½	1¾ ^a	2½	3
	Sand lightweight	8	1½	1½	2	3¼	—
	Sand lightweight	≥ 12	1½	1½	1¾	2	2½

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- a. Tabulated values for restrained assemblies apply to beams spaced more than 4 feet on center. For restrained beams spaced 4 feet or less on center, minimum cover of ¾ inch is adequate for 4-hour ratings or less.
- b. For beam widths between 8 inches and 12 inches, minimum cover thickness can be determined by direct interpolation.
- c. Not practical for 8-inch-wide beam but shown for purposes of interpolation.

TABLE 721.2.3(5)
MINIMUM COVER FOR PRESTRESSED CONCRETE BEAMS OF ALL WIDTHS

RESTRAINED OR UNRESTRAINED ^a	CONCRETE AGGREGATE TYPE	BEAM AREA ^b A (square inches)	FIRE-RESISTANCE RATING (hours)				
			1	1½	2	3	4
Restrained	All	40 ≤ A ≤ 150	1½	1½	2	2½	—
	Carbonate or siliceous	150 < A ≤ 300	1½	1½	1½	1¾	2½
		300 < A	1½	1½	1½	1½	2
	Sand lightweight	150 < A	1½	1½	1½	1½	2
Unrestrained	All	40 ≤ A ≤ 150	2	2½	—	—	—
	Carbonate or siliceous	150 < A ≤ 300	1½	1¾	2½	—	—
		300 < A	1½	1½	2	3 ^c	4 ^c
	Sand lightweight	150 < A	1½	1½	2	3 ^c	4 ^c

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- a. Tabulated values for restrained assemblies apply to beams spaced more than 4 feet on center. For restrained beams spaced 4 feet or less on center, minimum cover of ¾ inch is adequate for 4-hour ratings or less.
- b. The cross-sectional area of a stem is permitted to include a portion of the area in the flange, provided the width of the flange used in the calculation does not exceed three times the average width of the stem.
- c. U-shaped or hooped stirrups spaced not to exceed the depth of the member and having a minimum cover of 1 inch shall be provided.

721.2.4 Concrete columns. Concrete columns shall comply with this section.

TABLE 721.2.4
MINIMUM DIMENSION OF CONCRETE COLUMNS (inches)

TYPES OF CONCRETE	FIRE-RESISTANCE RATING (hours)				
	1	1½	2 ^a	3 ^a	4 ^b
Siliceous	8	9	10	12	14
Carbonate	8	9	10	11	12
Sand-lightweight	8	8½	9	10½	12

For SI: 1 inch = 25 mm.

- a. The minimum dimension is permitted to be reduced to 8 inches for rectangular columns with two parallel sides at least 36 inches in length.
- b. The minimum dimension is permitted to be reduced to 10 inches for rectangular columns with two parallel sides at least 36 inches in length.

721.2.4.1 Minimum size. The minimum overall dimensions of reinforced concrete columns for fire-resistance

ratings of 1 hour to 4 hours shall comply with Table 721.2.4.

721.2.4.2 Minimum cover for R/C columns. The minimum thickness of concrete cover to the main longitudinal reinforcement in columns, regardless of the type of aggregate used in the concrete, shall not be less than 1 inch (25 mm) times the number of hours of required fire resistance or 2 inches (51 mm), whichever is less.

721.2.4.3 Columns built into walls. The minimum dimensions of Table 721.2.4 do not apply to a reinforced concrete column that is built into a concrete or masonry wall provided all of the following are met:

1. The fire-resistance rating for the wall is equal to or greater than the required rating of the column;
2. The main longitudinal reinforcing in the column has cover not less than that required by Section 721.2.4.2; and

- 3. Openings in the wall are protected in accordance with Table 715.4.

Where openings in the wall are not protected as required by Section 715.4, the minimum dimension of columns required to have a fire-resistance rating of 3 hours or less shall be 8 inches (203 mm), and 10 inches (254 mm) for columns required to have a fire-resistance rating of 4 hours, regardless of the type of aggregate used in the concrete.

721.2.4.4 Precast cover units for steel columns. See Section 721.5.1.4.

721.3 Concrete masonry. The provisions of this section contain procedures by which the fire-resistance ratings of concrete masonry are established by calculations.

721.3.1 Equivalent thickness. The equivalent thickness of concrete masonry construction shall be determined in accordance with the provisions of this section.

721.3.1.1 Concrete masonry unit plus finishes. The equivalent thickness of concrete masonry assemblies, T_{ea} , shall be computed as the sum of the equivalent thickness of the concrete masonry unit, T_e , as determined by Section 721.3.1.2, 721.3.1.3, or 721.3.1.4, plus the equivalent thickness of finishes, T_{ef} , determined in accordance with Section 721.3.2:

$$T_{ea} = T_e + T_{ef} \quad \text{(Equation 7-6)}$$

$$T_e = V_n / LH = \text{Equivalent thickness of concrete masonry unit (inch) (mm).}$$

where:

V_n = Net volume of masonry unit (inch³) (mm³).

L = Specified length of masonry unit (inch) (mm).

H = Specified height of masonry unit (inch) (mm).

721.3.1.2 UngROUTED or partially grouted construction. T_e shall be the value obtained for the concrete masonry unit determined in accordance with ASTM C 140.

721.3.1.3 Solid grouted construction. The equivalent thickness, T_e , of solid grouted concrete masonry units is the actual thickness of the unit.

721.3.1.4 Airspaces and cells filled with loose-fill material. The equivalent thickness of completely filled hollow concrete masonry is the actual thickness of the unit when loose-fill materials are: sand, pea gravel, crushed stone, or slag that meet ASTM C 33 requirements; pumice, scoria, expanded shale, expanded clay, expanded slate, expanded slag, expanded fly ash, or cinders that comply with ASTM C 331; or perlite or vermiculite meeting the requirements of ASTM C 549 and ASTM C 516, respectively.

721.3.2 Concrete masonry walls. The fire-resistance rating of walls and partitions constructed of concrete masonry units shall be determined from Table 721.3.2. The rating shall be based on the equivalent thickness of the masonry and type of aggregate used.

721.3.2.1 Finish on nonfire-exposed side. Where plaster or gypsum wallboard is applied to the side of the wall not exposed to fire, the contribution of the finish to the total fire-resistance rating shall be determined as follows: The thickness of gypsum wallboard or plaster shall be corrected by multiplying the actual thickness of the finish by applicable factor determined from Table 721.2.1.4(1). This corrected thickness of finish shall be added to the equivalent thickness of masonry and the fire-resistance rating of the masonry and finish determined from Table 721.3.2.

721.3.2.2 Finish on fire-exposed side. Where plaster or gypsum wallboard is applied to the fire-exposed side of the wall, the contribution of the finish to the total fire-resistance rating shall be determined as follows: The time assigned to the finish as established by Table 721.2.1.4(2) shall be added to the fire-resistance rating determined in Section 721.3.2 for the masonry alone, or in Section 721.3.2.1 for the masonry and finish on the nonfire-exposed side.

TABLE 721.3.2
MINIMUM EQUIVALENT THICKNESS (inches) OF BEARING OR NONBEARING CONCRETE MASONRY WALLS^{a,b,c,d}

TYPE OF AGGREGATE	FIRE-RESISTANCE RATING (hours)															
	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	
Pumice or expanded slag	1.5	1.9	2.1	2.5	2.7	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.5	4.7	
Expanded shale, clay or slate	1.8	2.2	2.6	2.9	3.3	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	4.9	5.1	
Limestone, cinders or unexpanded slag	1.9	2.3	2.7	3.1	3.4	3.7	4.0	4.3	4.5	4.8	5.0	5.2	5.5	5.7	5.9	
Calcareous or siliceous gravel	2.0	2.4	2.8	3.2	3.6	3.9	4.2	4.5	4.8	5.0	5.3	5.5	5.8	6.0	6.2	

For SI: 1 inch = 25.4 mm.

- a. Values between those shown in the table can be determined by direct interpolation.
- b. Where combustible members are framed into the wall, the thickness of solid material between the end of each member and the opposite face of the wall, or between members set in from opposite sides, shall not be less than 93 percent of the thickness shown in the table.
- c. Requirements of ASTM C 55, ASTM C 73 or ASTM C 90 shall apply.
- d. Minimum required equivalent thickness corresponding to the hourly fire-resistance rating for units with a combination of aggregate shall be determined by linear interpolation based on the percent by volume of each aggregate used in manufacture.

721.3.2.3 Nonsymmetrical assemblies. For a wall having no finish on one side or having different types or thicknesses of finish on each side, the calculation procedures of this section shall be performed twice, assuming either side of the wall to be the fire-exposed side. The fire-resistance rating of the wall shall not exceed the lower of the two values calculated.

Exception: For exterior walls with more than 5 feet (1524 mm) of horizontal separation, the fire shall be assumed to occur on the interior side only.

721.3.2.4 Minimum concrete masonry fire-resistance rating. Where the finish applied to a concrete masonry wall contributes to its fire-resistance rating, the masonry alone shall provide not less than one-half the total required fire-resistance rating.

721.3.2.5 Attachment of finishes. Installation of finishes shall be as follows:

1. Gypsum wallboard and gypsum lath applied to concrete masonry or concrete walls shall be secured to wood or steel furring members spaced not more than 16 inches (406 mm) on center (o.c.).
2. Gypsum wallboard shall be installed with the long dimension parallel to the furring members and shall have all joints finished.
3. Other aspects of the installation of finishes shall comply with the applicable provisions of Chapters 7 and 25.

721.3.3 Multiwythe masonry walls. The fire-resistance rating of wall assemblies constructed of multiple wythes of masonry materials shall be permitted to be based on the fire-resistance rating period of each wythe and the continuous airspace between each wythe in accordance with the following formula:

$$R_A = (R_1^{0.59} + R_2^{0.59} + \dots + R_n^{0.59} + A_1 + A_2 + \dots + A_n)^{1.7}$$

(Equation 7-7)

where:

R_A = Fire-resistance rating of the assembly (hours).

R_1, R_2, \dots, R_n = Fire-resistance rating of wythes for 1, 2, n (hours), respectively.

A_1, A_2, \dots, A_n = 0.30, factor for each continuous airspace for 1, 2, n , respectively, having a depth of $\frac{1}{2}$ inch (12.7 mm) or more between wythes.

721.3.4 Concrete masonry lintels. Fire-resistance ratings for concrete masonry lintels shall be determined based upon the nominal thickness of the lintel and the minimum thickness of concrete masonry or concrete, or any combination thereof,

covering the main reinforcing bars, as determined according to Table 721.3.4, or by approved alternate methods.

**TABLE 721.3.4
MINIMUM COVER OF LONGITUDINAL
REINFORCEMENT IN FIRE-RESISTANCE-RATED
REINFORCED CONCRETE MASONRY LINTELS (inches)**

NOMINAL WIDTH OF LINTEL (inches)	FIRE-RESISTANCE RATING (hours)			
	1	2	3	4
6	1½	2	—	—
8	1½	1½	1¾	3
10 or greater	1½	1½	1½	1¾

For SI: 1 inch = 25.4 mm.

721.3.5 Concrete masonry columns. The fire-resistance rating of concrete masonry columns shall be determined based upon the least plan dimension of the column in accordance with Table 721.3.5 or by approved alternate methods.

**TABLE 721.3.5
MINIMUM DIMENSION OF
CONCRETE MASONRY COLUMNS (inches)**

FIRE-RESISTANCE RATING (hours)			
1	2	3	4
8 inches	10 inches	12 inches	14 inches

For SI: 1 inch = 25.4 mm.

721.4 Clay brick and tile masonry. The provisions of this section contain procedures by which the fire-resistance ratings of clay brick and tile masonry are established by calculations.

721.4.1 Masonry walls. The fire-resistance rating of masonry walls shall be based upon the equivalent thickness as calculated in accordance with this section. The calculation shall take into account finishes applied to the wall and airspaces between wythes in multiwythe construction.

721.4.1.1 Equivalent thickness. The fire-resistance ratings of walls or partitions constructed of solid or hollow clay masonry units shall be determined from Table 721.4.1(1) or 721.4.1(2). The equivalent thickness of the clay masonry unit shall be determined by Equation 7-8 when using Table 721.4.1(1). The fire-resistance rating determined from Table 721.4.1(1) shall be permitted to be used in the calculated fire-resistance rating procedure in Section 721.4.2.

$$T_e = V_n / LH \tag{Equation 7-8}$$

where:

T_e = The equivalent thickness of the clay masonry unit (inches).

V_n = The net volume of the clay masonry unit (inch³).

**TABLE 721.4.1(1)
FIRE-RESISTANCE PERIODS OF CLAY MASONRY WALLS**

MATERIAL TYPE	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE RESISTANCE ^{a,b,c} (inches)			
	1 hour	2 hour	3 hour	4 hour
Solid brick of clay or shale ^d	2.7	3.8	4.9	6.0
Hollow brick or tile of clay or shale, unfilled	2.3	3.4	4.3	5.0
Hollow brick or tile of clay or shale, grouted or filled with materials specified in Section 721.4.1.1.3	3.0	4.4	5.5	6.6

For SI: 1 inch = 25.4 mm.

a. Equivalent thickness as determined from Section 721.4.1.1.

b. Calculated fire resistance between the hourly increments listed shall be determined by linear interpolation.

c. Where combustible members are framed in the wall, the thickness of solid material between the end of each member and the opposite face of the wall, or between members set in from opposite sides, shall not be less than 93 percent of the thickness shown.

d. For units in which the net cross-sectional area of cored brick in any plane parallel to the surface containing the cores is at least 75 percent of the gross cross-sectional area measured in the same plane.

**TABLE 721.4.1(2)
FIRE-RESISTANCE RATINGS FOR BEARING STEEL FRAME
BRICK VENEER WALLS OR PARTITIONS**

WALL OR PARTITION ASSEMBLY	PLASTER SIDE EXPOSED (hours)	BRICK FACED SIDE EXPOSED (hours)
Outside facing of steel studs: ¹ / ₂ " wood fiberboard sheathing next to studs, ³ / ₄ " airspace formed with ³ / ₄ " × 1 ⁵ / ₈ " wood strips placed over the fiberboard and secured to the studs; metal or wire lath nailed to such strips, ³ / ₄ " brick veneer held in place by filling ³ / ₄ " airspace between the brick and lath with mortar. Inside facing of studs: ³ / ₄ " unsanded gypsum plaster on metal or wire lath attached to ⁵ / ₁₆ " wood strips secured to edges of the studs.	1.5	4
Outside facing of steel studs: 1" insulation board sheathing attached to studs, 1" airspace, and ³ / ₄ " brick veneer attached to steel frame with metal ties every 5th course. Inside facing of studs: ⁷ / ₈ " sanded gypsum plaster (1:2 mix) applied on metal or wire lath attached directly to the studs.	1.5	4
Same as above except use ⁷ / ₈ " vermiculite—gypsum plaster or 1" sanded gypsum plaster (1:2 mix) applied to metal or wire.	2	4
Outside facing of steel studs: ¹ / ₂ " gypsum sheathing board, attached to studs, and ³ / ₄ " brick veneer attached to steel frame with metal ties every 5th course. Inside facing of studs: ¹ / ₂ " sanded gypsum plaster (1:2 mix) applied to ¹ / ₂ " perforated gypsum lath securely attached to studs and having strips of metal lath 3 inches wide applied to all horizontal joints of gypsum lath.	2	4

For SI: 1 inch = 25.4 mm.

L = The specified length of the clay masonry unit (inches).

H = The specified height of the clay masonry unit (inches).

721.4.1.1.1 Hollow clay units. The equivalent thickness, *T_e*, shall be the value obtained for hollow clay units as determined in accordance with ASTM C 67.

721.4.1.1.2 Solid grouted clay units. The equivalent thickness of solid grouted clay masonry units shall be taken as the actual thickness of the units.

721.4.1.1.3 Units with filled cores. The equivalent thickness of the hollow clay masonry units is the actual thickness of the unit when completely filled

with loose-fill materials of: sand, pea gravel, crushed stone, or slag that meet ASTM C 33 requirements; pumice, scoria, expanded shale, expanded clay, expanded slate, expanded slag, expanded fly ash, or cinders in compliance with ASTM C 331; or perlite or vermiculite meeting the requirements of ASTM C 549 and ASTM C 516, respectively.

721.4.1.2 Plaster finishes. Where plaster is applied to the wall, the total fire-resistance rating shall be determined by the formula:

$$R = (R_n^{0.59} + pl)^{1.7} \tag{Equation 7-9}$$

where:

R = The fire-resistance rating of the assembly (hours).

R_n = The fire-resistance rating of the individual wall (hours).

pl = Coefficient for thickness of plaster.

Values for $R_n^{0.59}$ for use in Equation 7-9 are given in Table 721.4.1(3). Coefficients for thickness of plaster shall be selected from Table 721.4.1(4) based on the actual thickness of plaster applied to the wall or partition and whether one or two sides of the wall are plastered.

721.4.1.3 Multiwythe walls with airspace. Where a continuous airspace separates multiple wythes of the wall or partition, the total fire-resistance rating shall be determined by the formula:

$$R = (R_1^{0.59} + R_2^{0.59} + \dots + R_n^{0.59} + as)^{1.7} \quad \text{(Equation 7-10)}$$

where:

R = The fire-resistance rating of the assembly (hours).

R_1, R_2 and R_n = The fire-resistance rating of the individual wythes (hours).

as = Coefficient for continuous airspace.

Values for $R_n^{0.59}$ for use in Equation 7-10 are given in Table 721.4.1(3). The coefficient for each continuous airspace of $1/2$ inch to $3 1/2$ inches (12.7 to 89 mm) separating two individual wythes shall be 0.3.

TABLE 721.4.1(3)
VALUES OF $R_n^{0.59}$

$R_n^{0.59}$	R (hours)
1	1.0
2	1.50
3	1.91
4	2.27

TABLE 721.4.1(4)
COEFFICIENTS FOR PLASTER, pl^a

THICKNESS OF PLASTER (inch)	ONE SIDE	TWO SIDE
$1/2$	0.3	0.6
$5/8$	0.37	0.75
$3/4$	0.45	0.90

For SI: 1 inch = 25.4 mm.

a. Values listed in table are for 1:3 sanded gypsum plaster.

TABLE 721.4.1(5)
REINFORCED MASONRY LINTELS

NOMINAL LINTEL WIDTH (inches)	MINIMUM LONGITUDINAL REINFORCEMENT COVER FOR FIRE RESISTANCE (inch)			
	1 hour	2 hour	3 hour	4 hour
6	$1 1/2$	2	NP	NP
8	$1 1/2$	$1 1/2$	$1 3/4$	3
10 or more	$1 1/2$	$1 1/2$	$1 1/2$	$1 3/4$

For SI: 1 inch = 25.4 mm.

NP = Not permitted.

TABLE 721.4.1(6)
REINFORCED CLAY MASONRY COLUMNS

COLUMN SIZE	FIRE-RESISTANCE RATING (hour)			
	1	2	3	4
Minimum column dimension (inches)	8	10	12	14

For SI: 1 inch = 25.4 mm.

721.4.1.4 Nonsymmetrical assemblies. For a wall having no finish on one side or having different types or thicknesses of finish on each side, the calculation procedures of this section shall be performed twice, assuming either side to be the fire-exposed side of the wall. The fire resistance of the wall shall not exceed the lower of the two values determined.

Exception: For exterior walls with more than 5 feet (1524 mm) of horizontal separation, the fire shall be assumed to occur on the interior side only.

721.4.2 Multiwythe walls. The fire-resistance rating for walls or partitions consisting of two or more dissimilar wythes shall be permitted to be determined by the formula:

$$R = (R_1^{0.59} + R_2^{0.59} + \dots + R_n^{0.59})^{1.7} \quad \text{(Equation 7-11)}$$

where:

R = The fire-resistance rating of the assembly (hours).

R_1, R_2 and R_n = The fire-resistance rating of the individual wythes (hours).

Values for $R_n^{0.59}$ for use in Equation 7-11 are given in Table 721.4.1(3).

721.4.2.1 Multiwythe walls of different material. For walls that consist of two or more wythes of different materials (concrete or concrete masonry units) in combination with clay masonry units, the fire-resistance rating of the different materials shall be permitted to be determined from Table 721.2.1.1 for concrete; Table 721.3.2 for concrete masonry units or Table 721.4.1(1) or 721.4.1(2) for clay and tile masonry units.

721.4.3 Reinforced clay masonry lintels. Fire-resistance ratings for clay masonry lintels shall be determined based on the nominal width of the lintel and the minimum covering for the longitudinal reinforcement in accordance with Table 721.4.1(5).

721.4.4 Reinforced clay masonry columns. The fire-resistance ratings shall be determined based on the last plan dimension of the column in accordance with Table 721.4.1(6). The minimum cover for longitudinal reinforcement shall be 2 inches (51 mm).

721.5 Steel assemblies. The provisions of this section contain procedures by which the fire-resistance ratings of steel assemblies are established by calculations.

721.5.1 Structural steel columns. The fire-resistance ratings of steel columns shall be based on the size of the element and the type of protection provided in accordance with this section.

TABLE 721.5.1(1)
W/D RATIOS FOR STEEL COLUMNS

STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE	STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE
W14 × 233	2.49	3.65	W10 × 112	1.78	2.57
× 211	2.28	3.35	× 100	1.61	2.33
× 193	2.10	3.09	× 88	1.43	2.08
× 176	1.93	2.85	× 77	1.26	1.85
× 159	1.75	2.60	× 68	1.13	1.66
× 145	1.61	2.39	× 60	1.00	1.48
× 132	1.52	2.25	× 54	0.91	1.34
× 120	1.39	2.06	× 49	0.83	1.23
× 109	1.27	1.88	× 45	0.87	1.24
× 99	1.16	1.72	× 39	0.76	1.09
× 90	1.06	1.58	× 33	0.65	0.93
× 82	1.20	1.68			
× 74	1.09	1.53	W8 × 67	1.34	1.94
× 68	1.01	1.41	× 58	1.18	1.71
× 61	0.91	1.28	× 48	0.99S	1.44
× 53	0.89	1.21	× 40	0.83	1.23
× 48	0.81	1.10	× 35	0.73	1.08
× 43	0.73	0.99	× 31	0.65	0.97
			× 28	0.67	0.96
W12 × 190	2.46	3.51	× 24	0.58	0.83
× 170	2.22	3.20	× 21	0.57	0.77
× 152	2.01	2.90	× 18	0.49	0.67
× 136	1.82	2.63			
× 120	1.62	2.36	W6 × 25	0.69	1.00
× 106	1.44	2.11	× 20	0.56	0.82
× 96	1.32	1.93	× 16	0.57	0.78
× 87	1.20	1.76	× 15	0.42	0.63
× 79	1.10	1.61	× 12	0.43	0.60
× 72	1.00	1.48	× 9	0.33	0.46
× 65	0.91	1.35			
× 58	0.91	1.31	W5 × 19	0.64	0.93
× 53	0.84	1.20	× 16	0.54	0.80
× 50	0.89	1.23			
× 45	0.81	1.12	W4 × 13	0.54	0.79
× 40	0.72	1.00			

For SI: 1 pound per linear foot per inch = 0.059 kg/m/mm.

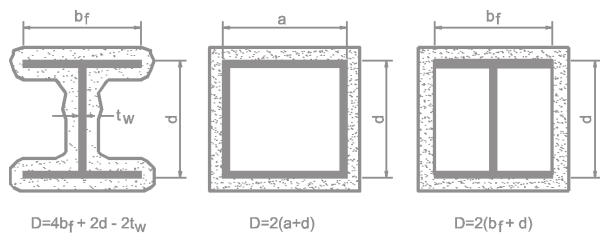


FIGURE 721.5.1(1)
DETERMINATION OF THE HEATED PERIMETER
OF STRUCTURAL STEEL COLUMNS

721.5.1.1 General. These procedures establish a basis for determining the fire resistance of column assemblies as a function of the thickness of fire-resistant material and, the weight, W , and heated perimeter, D , of steel columns. As used in these sections, W is the average weight of a structural steel column in pounds per linear foot. The heated perimeter, D , is the inside perimeter of the fire-resistant material in inches as illustrated in Figure 721.5.1(1).

721.5.1.1.1 Nonload-bearing protection. The application of these procedures shall be limited to column assemblies in which the fire-resistant material is not designed to carry any of the load acting on the column.

721.5.1.1.2 Embedments. In the absence of substantiating fire-endurance test results, ducts, conduit, piping, and similar mechanical, electrical, and plumbing

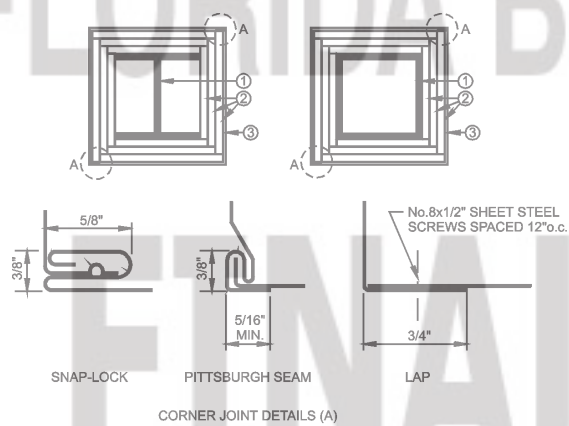


FIGURE 721.5.1(2)
GYPSUM WALLBOARD PROTECTED STRUCTURAL STEEL
COLUMNS WITH SHEET STEEL COLUMN COVERS

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

1. Structural steel column, either wide flange or tubular shapes.
2. Type X gypsum wallboard in accordance with ASTM C 36. For single-layer applications, the wallboard shall be applied vertically with no horizontal joints. For multiple-layer applications, horizontal joints are permitted at a minimum spacing of 8 feet, provided that the joints in successive layers are staggered at least 12 inches. The total required thickness of wallboard shall be determined on the basis of the specified fire-resistance rating and the weight-to-heated-perimeter ratio (W/D) of the column. For fire-resistance ratings of 2 hours or less, one of the required layers of gypsum wallboard may be applied to the exterior of the sheet steel column covers with 1-inch-long Type S screws spaced 1 inch from the wallboard edge and 8 inches on center. For such installations, 0.0149-inch minimum thickness galvanized steel corner beads with 1 1/2-inch legs shall be attached to the wallboard with Type S screws spaced 12 inches on center.
3. For fire-resistance ratings of 3 hours or less, the column covers shall be fabricated from 0.0239-inch minimum thickness galvanized or stainless steel. For 4-hour fire-resistance ratings, the column covers shall be fabricated from 0.0239-inch minimum thickness stainless steel. The column covers shall be erected with the Snap Lock or Pittsburgh joint details. For fire-resistance ratings of 2 hours or less, column covers fabricated from 0.0269-inch minimum thickness galvanized or stainless steel shall be permitted to be erected with lap joints. The lap joints shall be permitted to be located anywhere around the perimeter of the column cover. The lap joints shall be secured with 1/2-inch-long No. 8 sheet metal screws spaced 12 inches on center.

The column covers shall be provided with a minimum expansion clearance of 1/8 inch per linear foot between the ends of the cover and any restraining construction.

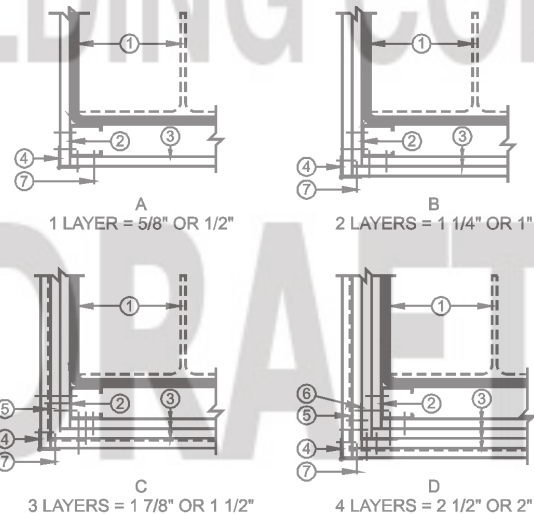
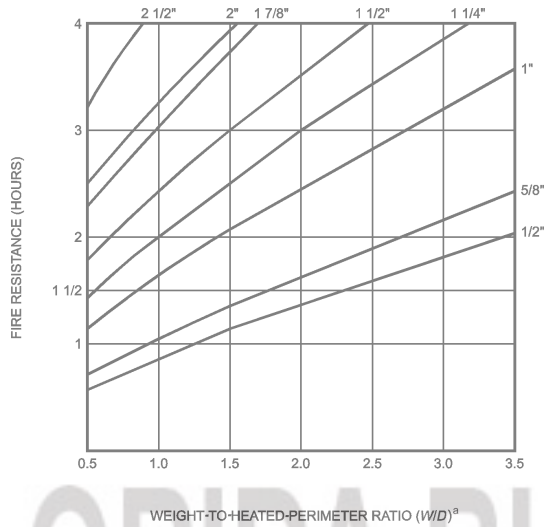


FIGURE 721.5.1(3)
GYPSUM WALLBOARD PROTECTED STRUCTURAL STEEL
COLUMNS WITH STEEL STUD/SCREW ATTACHMENT SYSTEM

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

1. Structural steel column, either wide flange or tubular shapes.
2. 1 5/8-inch deep studs fabricated from 0.0179-inch minimum thickness galvanized steel with 1 5/16 or 1 7/16-inch legs. The length of the steel studs shall be 1/2 inch less than the height of the assembly.
3. Type X gypsum wallboard in accordance with ASTM C 36. For single-layer applications, the wallboard shall be applied vertically with no horizontal joints. For multiple-layer applications, horizontal joints are permitted at a minimum spacing of 8 feet, provided that the joints in successive layers are staggered at least 12 inches. The total required thickness of wallboard shall be determined on the basis of the specified fire-resistance rating and the weight-to-heated-perimeter ratio (W/D) of the column.
4. Galvanized 0.0149-inch minimum thickness steel corner beads with 1 1/2-inch legs attached to the wallboard with 1-inch-long Type S screws spaced 12 inches on center.
5. No. 18 SWG steel tie wires spaced 24 inches on center.
6. Sheet metal angles with 2-inch legs fabricated from 0.0221-inch minimum thickness galvanized steel.
7. Type S screws, 1 inch long, shall be used for attaching the first layer of wallboard to the steel studs and the third layer to the sheet metal angles at 24 inches on center. Type S screws 1 3/4-inch long shall be used for attaching the second layer of wallboard to the steel studs and the fourth layer to the sheet metal angles at 12 inches on center. Type S screws 2 1/4 inches long shall be used for attaching the third layer of wallboard to the steel studs at 12 inches on center.



For SI: 1 inch = 25.4 mm, 1 pound per linear foot/inch = 0.059 kg/m/mm.

FIGURE 721.5.1(4)
FIRE RESISTANCE OF STRUCTURAL STEEL COLUMNS
PROTECTED WITH VARIOUS THICKNESSES OF
TYPE X GYPSUM WALLBOARD

- a. The W/D ratios for typical wide flange columns are listed in Table 721.5.1(1). For other column shapes, the W/D ratios shall be determined in accordance with Section 720.5.1.1.

installations shall not be embedded in any required fire-resistant materials.

721.5.1.1.3 Weight-to-perimeter ratio. Table 721.5.1(1) contains weight-to-heated-perimeter ratios (W/D) for both contour and box fire-resistant profiles, for the wide flange shapes most often used as columns. For different fire-resistant protection profiles or column cross sections, the weight-to-heated-perimeter ratios (W/D) shall be determined in accordance with the definitions given in this section.

721.5.1.2 Gypsum wallboard protection. The fire resistance of structural steel columns with weight-to-heated-perimeter ratios (W/D) less than or equal to 3.65 and which are protected with Type X gypsum wall-

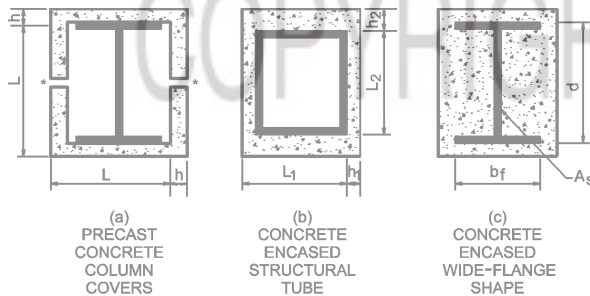


FIGURE 721.5.1(6)
CONCRETE PROTECTED STRUCTURAL STEEL COLUMNS^{a,b}

- a. When the inside perimeter of the concrete protection is not square, L shall be taken as the average of L_1 and L_2 . When the thickness of concrete cover is not constant, h shall be taken as the average of h_1 and h_2 .
- b. Joints shall be protected with a minimum 1 inch thickness of ceramic fiber blanket but in no case less than one-half the thickness of the column cover (see Section 720.2.1.3).

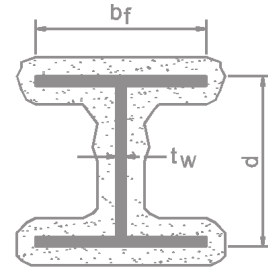


FIGURE 721.5.1(5)
WIDE FLANGE STRUCTURAL STEEL COLUMNS WITH
SPRAY-APPLIED FIRE-RESISTANT MATERIALS

board shall be permitted to be determined from the following expression:

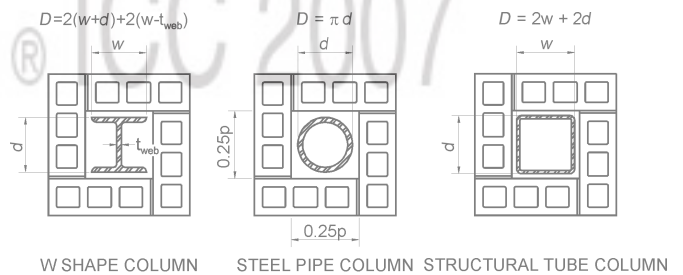
$$R = 130 \left[\frac{h(W'/D)}{2} \right]^{0.75} \quad \text{(Equation 7-12)}$$

where:

- R = Fire resistance (minutes).
- h = Total thickness of gypsum wallboard (inches).
- D = Heated perimeter of the structural steel column (inches).
- W' = Total weight of the structural steel column and gypsum wallboard protection (pounds per linear foot).
- $W' = W + 50hD/144.$

721.5.1.2.1 Attachment. The gypsum wallboard shall be supported as illustrated in either Figure 721.5.1(2) for fire-resistance ratings of 4 hours or less, or Figure 721.5.1(3) for fire-resistance ratings of 3 hours or less.

721.5.1.2.2 Gypsum wallboard equivalent to concrete. The determination of the fire resistance of structural steel columns from Figure 721.5.1(4) is permitted for various thicknesses of gypsum wall-



For SI: 1 inch = 25.4 mm.

FIGURE 721.5.1(7)
CONCRETE OR CLAY MASONRY PROTECTED
STRUCTURAL STEEL COLUMNS

- d = Depth of a wide flange column, outside diameter of pipe column, or outside dimension of structural tubing column (inches).
- t_{web} = Thickness of web of wide flange column (inches).
- w = Width of flange of wide flange column (inches).

board as a function of the weight-to-heated-perimeter ratio (W/D) of the column. For structural steel columns with weight-to-heated-perimeter ratios (W/D) greater than 3.65, the thickness of gypsum wallboard required for specified fire-resistance ratings shall be the same as the thickness determined for a $W14 \times 233$ wide flange shape.

721.5.1.3 Spray-applied fire-resistant materials. The fire resistance of wide-flange structural steel columns protected with spray-applied fire-resistant materials, as illustrated in Figure 721.5.1(5), shall be permitted to be determined from the following expression:

$$R = [C_1 (W/D) + C_2] h \quad \text{(Equation 7-13)}$$

where:

- R = Fire resistance (minutes).
- h = Thickness of spray-applied fire-resistant material (inches).
- D = Heated perimeter of the structural steel column (inches).
- C_1 and C_2 = Material-dependent constants.
- W = Weight of structural steel columns (pounds per linear foot).

The fire resistance of structural steel columns protected with intumescent or mastic fire-resistant coatings shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

721.5.1.3.1 Material-dependent constants. The material-dependent constants, C_1 and C_2 , shall be determined for specific fire-resistant materials on the basis of standard fire endurance tests in accordance with Section 703.2. Unless evidence is submitted to the building official substantiating a broader application, this expression shall be limited to determining the fire resistance of structural steel columns with weight-to-heated-perimeter ratios (W/D) between the largest and smallest columns for which standard fire-resistance test results are available.

721.5.1.3.2 Spray-applied identification. Spray-applied fire-resistant materials shall be identified by density and thickness required for a given fire-resistance rating.

721.5.1.4 Concrete-protected columns. The fire resistance of structural steel columns protected with concrete, as illustrated in Figure 721.5.1(6) (a) and (b), shall be permitted to be determined from the following expression:

$$R = R_o (1 + 0.03 m) \quad \text{(Equation 7-14)}$$

where:

$$R_o = 10 (W/D)^{0.7} + 17 (h^{1.6}/k_c^{0.2}) \times (1 + 26 (H/p_c c h (L + h))^{0.8})$$

As used in these expressions:

- R = Fire endurance at equilibrium moisture conditions (minutes).

- R_o = Fire endurance at zero moisture content (minutes).
- m = Equilibrium moisture content of the concrete by volume (percent).
- W = Average weight of the steel column (pounds per linear foot).
- D = Heated perimeter of the steel column (inches).
- h = Thickness of the concrete cover (inches).
- k_c = Ambient temperature thermal conductivity of the concrete (Btu/hr ft °F).
- H = Ambient temperature thermal capacity of the steel column = $0.11 W$ (Btu/ ft °F).
- p_c = Concrete density (pounds per cubic foot).
- c_c = Ambient temperature specific heat of concrete (Btu/lb °F).
- L = Interior dimension of one side of a square concrete box protection (inches).

721.5.1.4.1 Reentrant space filled. For wide-flange steel columns completely encased in concrete with all reentrant spaces filled [Figure 721.5.1(6)(c)], the thermal capacity of the concrete within the reentrant spaces shall be permitted to be added to the thermal capacity of the steel column, as follows:

$$H = 0.11 W + (p_c c_c / 144) (b_f d - A_s) \quad \text{(Equation 7-15)}$$

where:

- b_f = Flange width of the steel column (inches).
- d = Depth of the steel column (inches).
- A_s = Cross-sectional area of the steel column (square inches).

721.5.1.4.2 Concrete properties unknown. If specific data on the properties of concrete are not available, the values given in Table 721.5.1(2) are permitted.

721.5.1.4.3 Minimum concrete cover. For structural steel column encased in concrete with all reentrant spaces filled, Figure 721.5.1(6)(c) and Tables 721.5.1(7) and 721.5.1(8) indicate the thickness of concrete cover required for various fire-resistance ratings for typical wide-flange sections. The thicknesses of concrete indicated in these tables also apply to structural steel columns larger than those listed.

721.5.1.4.4 Minimum precast concrete cover. For structural steel columns protected with precast concrete column covers as shown in Figure 721.5.1(6)(a), Tables 721.5.1(9) and 721.5.1(10) indicate the thickness of the column covers required for various fire-resistance ratings for typical wide-flange shapes. The thicknesses of concrete given in these tables also apply to structural steel columns larger than those listed.

721.5.1.4.5 Masonry protection. The fire resistance of structural steel columns protected with concrete masonry units or clay masonry units as illustrated in

Figure 721.5.1(7), shall be permitted to be determined from the following expression:

$$R = 0.17 (W/D)^{0.7} + [0.285 (T_e^{1.6}/K^{0.2})] [1.0 + 42.7 \{ (A_s/d_m T_e) / (0.25p + T_e) \}^{0.8}]$$

(Equation 7-16)

where:

R = Fire-resistance rating of column assembly (hours).

W = Average weight of steel column (pounds per foot).

D = Heated perimeter of steel column (inches) [see Figure 721.5.1(7)].

T_e = Equivalent thickness of concrete or clay masonry unit (inches) (see Table 721.3.2 Note a or Section 721.4.1).

K = Thermal conductivity of concrete or clay masonry unit (Btu/hr ft °F) [see Table 721.5.1(3)].

A_s = Cross-sectional area of steel column (square inches).

d_m = Density of the concrete or clay masonry unit (pounds per cubic foot).

p = Inner perimeter of concrete or clay masonry protection (inches) [see Figure 721.5.1(7)].

721.5.1.4.6 Equivalent concrete masonry thickness. For structural steel columns protected with concrete masonry, Table 721.5.1(5) gives the equivalent thickness of concrete masonry required for various fire-resistance ratings for typical column shapes. For structural steel columns protected with clay masonry, Table 721.5.1(6) gives the equivalent thickness of concrete masonry required for various fire-resistance ratings for typical column shapes.

721.5.2 Structural steel beams and girders. The fire-resistance ratings of steel beams and girders shall be based upon the size of the element and the type of protection provided in accordance with this section.

721.5.2.1 Determination of fire resistance. These procedures establish a basis for determining resistance of structural steel beams and girders which differ in size from that specified in approved fire-resistance-rated assemblies as a function of the thickness of fire-resistant material and the weight (*W*) and heated perimeter (*D*) of

the beam or girder. As used in these sections, *W* is the average weight of a structural steel member in pounds per linear foot (plf). The heated perimeter, *D*, is the inside perimeter of the fire-resistant material in inches as illustrated in Figure 721.5.2.

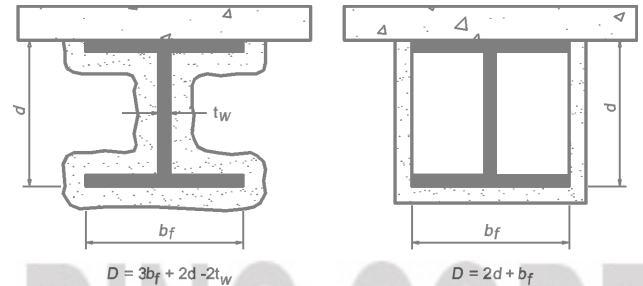


FIGURE 721.5.2 DETERMINATION OF THE HEATED PERIMETER OF STRUCTURAL STEEL BEAMS AND GIRDERS

721.5.2.1.1 Weight-to-heated perimeter. The weight-to-heated-perimeter ratios (*W/D*), for both contour and box fire-resistant protection profiles, for the wide flange shapes most often used as beams or girders are given in Table 721.5.1(4). For different shapes, the weight-to-heated-perimeter ratios (*W/D*) shall be determined in accordance with the definitions given in this section.

721.5.2.1.2 Beam and girder substitutions. Except as provided for in Section 721.5.2.2, structural steel beams in approved fire-resistance-rated assemblies shall be considered the minimum permissible size. Other beam or girder shapes shall be permitted to be substituted provided that the weight-to-heated-perimeter ratio (*W/D*) of the substitute beam is equal to or greater than that of the beam specified in the approved assembly.

721.5.2.2 Spray-applied fire-resistant materials. The provisions in this section apply to structural steel beams and girders protected with spray-applied fire-resistant materials. Larger or smaller beam and girder shapes shall be permitted to be substituted for beams specified in approved unrestrained or restrained fire-resistance-rated

TABLE 721.5.1(2) PROPERTIES OF CONCRETE

PROPERTY	NORMAL-WEIGHT CONCRETE	STRUCTURAL LIGHTWEIGHT CONCRETE
Thermal conductivity (<i>k_c</i>)	0.95 Btu/hr ft °F	0.35 Btu/hr ft °F
Specific heat (<i>c_c</i>)	0.20 Btu/lb °F	0.20 Btu/lb °F
Density (<i>P_c</i>)	145 lb/ft ³	110 lb/ft ³
Equilibrium (free) moisture content (<i>m</i>) by volume	4%	5%

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lb/ft³ = 16.0185 kg/m³, Btu/hr ft °F = 1.731 W/(m · K).

TABLE 721.5.1(3)
THERMAL CONDUCTIVITY OF CONCRETE OR CLAY
MASONRY UNITS

DENSITY (d_m) OF UNITS (lb/ft ³)	THERMAL CONDUCTIVITY (K) OF UNITS (Btu/hr ft °F)
Concrete Masonry Units	
80	0.207
85	0.228
90	0.252
95	0.278
100	0.308
105	0.340
110	0.376
115	0.416
120	0.459
125	0.508
130	0.561
135	0.620
140	0.685
145	0.758
150	0.837
Clay Masonry Units	
120	1.25
130	2.25

For SI: 1 pound per cubic foot = 16.0185 kg/m³, Btu per hour foot °F = 1.731 W/(m · K).

TABLE 721.5.1(4)
WEIGHT-TO-HEATED-PERIMETER RATIOS (W/D)
FOR TYPICAL WIDE FLANGE BEAM AND GIRDER SHAPES

STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE	STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE
W36 × 300	2.47	3.33	× 68	0.92	1.21
× 280	2.31	3.12	× 62	0.92	1.14
× 260	2.16	2.92	× 55	0.82	1.02
× 245	2.04	2.76			
× 230	1.92	2.61	W21 × 147	1.83	2.60
× 210	1.94	2.45	× 132	1.66	2.35
× 194	1.80	2.28	× 122	1.54	2.19
× 182	1.69	2.15	× 111	1.41	2.01
× 170	1.59	2.01	× 101	1.29	1.84
× 160	1.50	1.90	× 93	1.38	1.80
× 150	1.41	1.79	× 83	1.24	1.62
× 135	1.28	1.63	× 73	1.10	1.44
			× 68	1.03	1.35
W33 × 241	2.11	2.86	× 62	0.94	1.23
× 221	1.94	2.64	× 57	0.93	1.17
× 201	1.78	2.42	× 50	0.83	1.04
× 152	1.51	1.94	× 44	0.73	0.92
× 141	1.41	1.80			
× 130	1.31	1.67	W18 × 119	1.69	2.42
× 118	1.19	1.53	× 106	1.52	2.18
			× 97	1.39	2.01
W30 × 211	2.00	2.74	× 86	1.24	1.80
× 191	1.82	2.50	× 76	1.11	1.60
× 173	1.66	2.28	× 71	1.21	1.59
× 132	1.45	1.85	× 65	1.11	1.47
× 124	1.37	1.75	× 60	1.03	1.36
× 116	1.28	1.65	× 55	0.95	1.26
× 108	1.20	1.54	× 50	0.87	1.15
× 99	1.10	1.42	× 46	0.86	1.09
			× 40	0.75	0.96
			× 35	0.66	0.85
W27 × 178	1.85	2.55			
× 161	1.68	2.33			
× 146	1.53	2.12	W16 × 100	1.56	2.25
× 114	1.36	1.76	× 89	1.40	2.03
× 102	1.23	1.59	× 77	1.22	1.78
× 94	1.13	1.47	× 67	1.07	1.56
× 84	1.02	1.33	× 57	1.07	1.43
			× 50	0.94	1.26
			× 45	0.85	1.15
W24 × 162	1.85	2.57	× 40	0.76	1.03
× 146	1.68	2.34	× 36	0.69	0.93
× 131	1.52	2.12	× 31	0.65	0.83
× 117	1.36	1.91	× 26	0.55	0.70
× 104	1.22	1.71			
× 94	1.26	1.63	W14 × 132	1.83	3.00
× 84	1.13	1.47	× 120	1.67	2.75
× 76	1.03	1.34	× 109	1.53	2.52

(continued)

FIRE-RESISTANCE-RATED CONSTRUCTION

TABLE 721.5.1(4)—continued
WEIGHT-TO-HEATED-PERIMETER RATIOS (*W/D*)
FOR TYPICAL WIDE FLANGE BEAM AND GIRDER SHAPES

STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE	STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE
× 99	1.39	2.31	× 30	0.79	1.12
× 90	1.27	2.11	× 26	0.69	0.98
× 82	1.41	2.12	× 22	0.59	0.84
× 74	1.28	1.93	× 19	0.59	0.78
× 68	1.19	1.78	× 17	0.54	0.70
× 61	1.07	1.61	× 15	0.48	0.63
× 53	1.03	1.48	× 12	0.38	0.51
× 48	0.94	1.35			
× 43	0.85	1.22	W8 × 67	1.61	2.55
× 38	0.79	1.09	× 58	1.41	2.26
× 34	0.71	0.98	× 48	1.18	1.91
× 30	0.63	0.87	× 40	1.00	1.63
× 26	0.61	0.79	× 35	0.88	1.44
× 22	0.52	0.68	× 31	0.79	1.29
			× 28	0.80	1.24
W12 × 87	1.44	2.34	× 24	0.69	1.07
× 79	1.32	2.14	× 21	0.66	0.96
× 72	1.20	1.97	× 18	0.57	0.84
× 65	1.09	1.79	× 15	0.54	0.74
× 58	1.08	1.69	× 13	0.47	0.65
× 53	0.99	1.55	× 10	0.37	0.51
× 50	1.04	1.54			
× 45	0.95	1.40	W6 × 25	0.82	1.33
× 40	0.85	1.25	× 20	0.67	1.09
× 35	0.79	1.11	× 16	0.66	0.96
× 30	0.69	0.96	× 15	0.51	0.83
× 26	0.60	0.84	× 12	0.51	0.75
× 22	0.61	0.77	× 9	0.39	0.57
× 19	0.53	0.67			
× 16	0.45	0.57	W5 × 19	0.76	1.24
× 14	0.40	0.50	× 16	0.65	1.07
W10 × 112	2.14	3.38	W4 × 13	0.65	1.05
× 100	1.93	3.07			
× 88	1.70	2.75			
× 77	1.52	2.45			
× 68	1.35	2.20			
× 60	1.20	1.97			
× 54	1.09	1.79			
× 49	0.99	1.64			
× 45	1.03	1.59			
× 39	0.94	1.40			
× 33	0.77	1.20			

For SI: Pounds per linear foot per inch = 0.059 kg/m/mm.

TABLE 721.5.1(5)
FIRE RESISTANCE OF CONCRETE MASONRY PROTECTED STEEL COLUMNS

COLUMN SIZE	CONCRETE MASONRY DENSITY POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CONCRETE MASONRY PROTECTION ASSEMBLY, T_e (inches)				COLUMN SIZE	CONCRETE MASONRY DENSITY POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CONCRETE MASONRY PROTECTION ASSEMBLY, T_e (inches)			
		1-hour	2-hour	3-hour	4-hour			1-hour	2-hour	3-hour	4-hour
W14 × 82	80	0.74	1.61	2.36	3.04	W10 × 68	80	0.72	1.58	2.33	3.01
	100	0.89	1.85	2.67	3.40		100	0.87	1.83	2.65	3.38
	110	0.96	1.97	2.81	3.57		110	0.94	1.95	2.79	3.55
	120	1.03	2.08	2.95	3.73		120	1.01	2.06	2.94	3.72
W14 × 68	80	0.83	1.70	2.45	3.13	W10 × 54	80	0.88	1.76	2.53	3.21
	100	0.99	1.95	2.76	3.49		100	1.04	2.01	2.83	3.57
	110	1.06	2.06	2.91	3.66		110	1.11	2.12	2.98	3.73
	120	1.14	2.18	3.05	3.82		120	1.19	2.24	3.12	3.90
W14 × 53	80	0.91	1.81	2.58	3.27	W10 × 45	80	0.92	1.83	2.60	3.30
	100	1.07	2.05	2.88	3.62		100	1.08	2.07	2.90	3.64
	110	1.15	2.17	3.02	3.78		110	1.16	2.18	3.04	3.80
	120	1.22	2.28	3.16	3.94		120	1.23	2.29	3.18	3.96
W14 × 43	80	1.01	1.93	2.71	3.41	W10 × 33	80	1.06	2.00	2.79	3.49
	100	1.17	2.17	3.00	3.74		100	1.22	2.23	3.07	3.81
	110	1.25	2.28	3.14	3.90		110	1.30	2.34	3.20	3.96
	120	1.32	2.38	3.27	4.05		120	1.37	2.44	3.33	4.12
W12 × 72	80	0.81	1.66	2.41	3.09	W8 × 40	80	0.94	1.85	2.63	3.33
	100	0.91	1.88	2.70	3.43		100	1.10	2.10	2.93	3.67
	110	0.99	1.99	2.84	3.60		110	1.18	2.21	3.07	3.83
	120	1.06	2.10	2.98	3.76		120	1.25	2.32	3.20	3.99
W12 × 58	80	0.88	1.76	2.52	3.21	W8 × 31	80	1.06	2.00	2.78	3.49
	100	1.04	2.01	2.83	3.56		100	1.22	2.23	3.07	3.81
	110	1.11	2.12	2.97	3.73		110	1.29	2.33	3.20	3.97
	120	1.19	2.23	3.11	3.89		120	1.36	2.44	3.33	4.12
W12 × 50	80	0.91	1.81	2.58	3.27	W8 × 24	80	1.14	2.09	2.89	3.59
	100	1.07	2.05	2.88	3.62		100	1.29	2.31	3.16	3.90
	110	1.15	2.17	3.02	3.78		110	1.36	2.42	3.28	4.05
	120	1.22	2.28	3.16	3.94		120	1.43	2.52	3.41	4.20
W12 × 40	80	1.01	1.94	2.72	3.41	W8 × 18	110	1.22	2.20	3.01	3.72
	100	1.17	2.17	3.01	3.75		100	1.36	2.40	3.25	4.01
	110	1.25	2.28	3.14	3.90		110	1.42	2.50	3.37	4.14
	120	1.32	2.39	3.27	4.06		120	1.48	2.59	3.49	4.28

(continued)

TABLE 721.5.1(5)—continued
FIRE RESISTANCE OF CONCRETE MASONRY PROTECTED STEEL COLUMNS

NOMINAL TUBE SIZE (inches)	CONCRETE MASONRY DENSITY, POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CONCRETE MASONRY PROTECTION ASSEMBLY, T_e (inches)				NOMINAL PIPE SIZE (inches)	CONCRETE MASONRY DENSITY, POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CONCRETE MASONRY PROTECTION ASSEMBLY, T_e (inches)			
		1-hour	2-hour	3-hour	4-hour			1-hour	2-hour	3-hour	4-hour
4 × 4 × 1/2 wall thickness	80	0.93	1.90	2.71	3.43	4 double extra strong 0.674 wall thickness	80	0.80	1.75	2.56	3.28
	100	1.08	2.13	2.99	3.76		100	0.95	1.99	2.85	3.62
	110	1.16	2.24	3.13	3.91		110	1.02	2.10	2.99	3.78
	120	1.22	2.34	3.26	4.06		120	1.09	2.20	3.12	3.93
4 × 4 × 3/8 wall thickness	80	1.05	2.03	2.84	3.57	4 extra strong 0.337 wall thickness	80	1.12	2.11	2.93	3.65
	100	1.20	2.25	3.11	3.88		100	1.26	2.32	3.19	3.95
	110	1.27	2.35	3.24	4.02		110	1.33	2.42	3.31	4.09
	120	1.34	2.45	3.37	4.17		120	1.40	2.52	3.43	4.23
4 × 4 × 1/4 wall thickness	80	1.21	2.20	3.01	3.73	4 standard 0.237 wall thickness	80	1.26	2.25	3.07	3.79
	100	1.35	2.40	3.26	4.02		100	1.40	2.45	3.31	4.07
	110	1.41	2.50	3.38	4.16		110	1.46	2.55	3.43	4.21
	120	1.48	2.59	3.50	4.30		120	1.53	2.64	3.54	4.34
6 × 6 × 1/2 wall thickness	80	0.82	1.75	2.54	3.25	5 double extra strong 0.750 wall thickness	80	0.70	1.61	2.40	3.12
	100	0.98	1.99	2.84	3.59		100	0.85	1.86	2.71	3.47
	110	1.05	2.10	2.98	3.75		110	0.91	1.97	2.85	3.63
	120	1.12	2.21	3.11	3.91		120	0.98	2.02	2.99	3.79
6 × 6 × 3/8 wall thickness	80	0.96	1.91	2.71	3.42	5 extra strong 0.375 wall thickness	80	1.04	2.01	2.83	3.54
	100	1.12	2.14	3.00	3.75		100	1.19	2.23	3.09	3.85
	110	1.19	2.25	3.13	3.90		110	1.26	2.34	3.22	4.00
	120	1.26	2.35	3.26	4.05		120	1.32	2.44	3.34	4.14
6 × 6 × 1/4 wall thickness	80	1.14	2.11	2.92	3.63	5 standard 0.258 wall thickness	80	1.20	2.19	3.00	3.72
	100	1.29	2.32	3.18	3.93		100	1.34	2.39	3.25	4.00
	110	1.36	2.43	3.30	4.08		110	1.41	2.49	3.37	4.14
	120	1.42	2.52	3.43	4.22		120	1.47	2.58	3.49	4.28
8 × 8 × 1/2 wall thickness	80	0.77	1.66	2.44	3.13	6 double extra strong 0.864 wall thickness	80	0.59	1.46	2.23	2.92
	100	0.92	1.91	2.75	3.49		100	0.73	1.71	2.54	3.29
	110	1.00	2.02	2.89	3.66		110	0.80	1.82	2.69	3.47
	120	1.07	2.14	3.03	3.82		120	0.86	1.93	2.83	3.63
8 × 8 × 3/8 wall thickness	80	0.91	1.84	2.63	3.33	6 extra strong 0.432 wall thickness	80	0.94	1.90	2.70	3.42
	100	1.07	2.08	2.92	3.67		100	1.10	2.13	2.98	3.74
	110	1.14	2.19	3.06	3.83		110	1.17	2.23	3.11	3.89
	120	1.21	2.29	3.19	3.98		120	1.24	2.34	3.24	4.04
8 × 8 × 1/4 wall thickness	80	1.10	2.06	2.86	3.57	6 standard 0.280 wall thickness	80	1.14	2.12	2.93	3.64
	100	1.25	2.28	3.13	3.87		100	1.29	2.33	3.19	3.94
	110	1.32	2.38	3.25	4.02		110	1.36	2.43	3.31	4.08
	120	1.39	2.48	3.38	4.17		120	1.42	2.53	3.43	4.22

For SI: 1 inch = 25.4 mm, 1 pound per cubic foot = 16.02 kg/m³.
Note: Tabulated values assume 1-inch air gap between masonry and steel section.

TABLE 721.5.1(6)
FIRE RESISTANCE OF CLAY MASONRY PROTECTED STEEL COLUMNS

COLUMN SIZE	CLAY MASONRY DENSITY, POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CLAY MASONRY PROTECTION ASSEMBLY, T_e (inches)				COLUMN SIZE	CLAY MASONRY DENSITY, POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CLAY MASONRY PROTECTION ASSEMBLY, T_e (inches)			
		1-hour	2-hour	3-hour	4-hour			1-hour	2-hour	3-hour	4-hour
W14 × 82	120	1.23	2.42	3.41	4.29	W10 × 68	120	1.27	2.46	3.26	4.35
	130	1.40	2.70	3.78	4.74		130	1.44	2.75	3.83	4.80
W14 × 68	120	1.34	2.54	3.54	4.43	W10 × 54	120	1.40	2.61	3.62	4.51
	130	1.51	2.82	3.91	4.87		130	1.58	2.89	3.98	4.95
W14 × 53	120	1.43	2.65	3.65	4.54	W10 × 45	120	1.44	2.66	3.67	4.57
	130	1.61	2.93	4.02	4.98		130	1.62	2.95	4.04	5.01
W14 × 43	120	1.54	2.76	3.77	4.66	W10 × 33	120	1.59	2.82	3.84	4.73
	130	1.72	3.04	4.13	5.09		130	1.77	3.10	4.20	5.13
W12 × 72	120	1.32	2.52	3.51	4.40	W8 × 40	120	1.47	2.70	3.71	4.61
	130	1.50	2.80	3.88	4.84		130	1.65	2.98	4.08	5.04
W12 × 58	120	1.40	2.61	3.61	4.50	W8 × 31	120	1.59	2.82	3.84	4.73
	130	1.57	2.89	3.98	4.94		130	1.77	3.10	4.20	5.17
W12 × 50	120	1.43	2.65	3.66	4.55	W8 × 24	120	1.66	2.90	3.92	4.82
	130	1.61	2.93	4.02	4.99		130	1.84	3.18	4.28	5.25
W12 × 40	120	1.54	2.77	3.78	4.67	W8 × 18	120	1.75	3.00	4.01	4.91
	130	1.72	3.05	4.14	5.10		130	1.93	3.27	4.37	5.34
STEEL TUBING						STEEL PIPE					
NOMINAL TUBE SIZE (inches)	CLAY MASONRY DENSITY, POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CLAY MASONRY PROTECTION ASSEMBLY, T_e (inches)				NOMINAL PIPE SIZE (inches)	CLAY MASONRY DENSITY, POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CLAY MASONRY PROTECTION ASSEMBLY, T_e (inches)			
		1-hour	2-hour	3-hour	4-hour			1-hour	2-hour	3-hour	4-hour
4 × 4 × 1/2 wall thickness	120	1.44	2.72	3.76	4.68	4 double extra strong 0.674 wall thickness	120	1.26	2.55	3.60	4.52
	130	1.62	3.00	4.12	5.11		130	1.42	2.82	3.96	4.95
4 × 4 × 3/8 wall thickness	120	1.56	2.84	3.88	4.78	4 extra strong 0.337 wall thickness	120	1.60	2.89	3.92	4.83
	130	1.74	3.12	4.23	5.21		130	1.77	3.16	4.28	5.25
4 × 4 × 1/4 wall thickness	120	1.72	2.99	4.02	4.92	4 standard 0.237 wall thickness	120	1.74	3.02	4.05	4.95
	130	1.89	3.26	4.37	5.34		130	1.92	3.29	4.40	5.37
6 × 6 × 1/2 wall thickness	120	1.33	2.58	3.62	4.52	5 double extra strong 0.750 wall thickness	120	1.17	2.44	3.48	4.40
	130	1.50	2.86	3.98	4.96		130	1.33	2.72	3.84	4.83
6 × 6 × 3/8 wall thickness	120	1.48	2.74	3.76	4.67	5 extra strong 0.375 wall thickness	120	1.55	2.82	3.85	4.76
	130	1.65	3.01	4.13	5.10		130	1.72	3.09	4.21	5.18
6 × 6 × 1/4 wall thickness	120	1.66	2.91	3.94	4.84	5 standard 0.258 wall thickness	120	1.71	2.97	4.00	4.90
	130	1.83	3.19	4.30	5.27		130	1.88	3.24	4.35	5.32
8 × 8 × 1/2 wall thickness	120	1.27	2.50	3.52	4.42	6 double extra strong 0.864 wall thickness	120	1.04	2.28	3.32	4.23
	130	1.44	2.78	3.89	4.86		130	1.19	2.60	3.68	4.67
8 × 8 × 3/8 wall thickness	120	1.43	2.67	3.69	4.59	6 extra strong 0.432 wall thickness	120	1.45	2.71	3.75	4.65
	130	1.60	2.95	4.05	5.02		130	1.62	2.99	4.10	5.08
8 × 8 × 1/4 wall thickness	120	1.62	2.87	3.89	4.78	6 standard 0.280 wall thickness	120	1.65	2.91	3.94	4.84
	130	1.79	3.14	4.24	5.21		130	1.82	3.19	4.30	5.27

TABLE 721.5.1(7)
MINIMUM COVER (inch) FOR STEEL COLUMNS
ENCASED IN NORMAL-WEIGHT CONCRETE^a
[FIGURE 721.5.1(6)(c)]

STRUCTURAL SHAPE	FIRE-RESISTANCE RATING (hours)				
	1	1 1/2	2	3	4
W14 × 233	1	1	1	1 1/2	2
× 176				2 1/2	
× 132					
× 90					
× 61			1 1/2	2	3
× 48					
× 43			1 1/2	2 1/2	
W12 × 152			1	1	1
× 96	2	3			
× 65					
× 50	1 1/2	2 1/2			
× 40	1 1/2	2 1/2			
W10 × 88	1	1 1/2	1 1/2	2	3
× 49	1			2 1/2	3 1/2
× 45					
× 39	2				
× 33	2				
W8 × 67	1			1 1/2	2 1/2
× 58	1	1 1/2	2	3 1/2	
× 48					
× 31					
× 21					
× 18					
W6 × 25	1	1 1/2	2	3	3 1/2
× 20		2	3	4	
× 16					
× 15		1 1/2	2 1/2	3 1/2	
× 9					

For SI: 1 inch = 25.4 mm.

a. The tabulated thicknesses are based upon the assumed properties of normal-weight concrete given in Table 721.5.1(2).

TABLE 721.5.1(8)
MINIMUM COVER (inch) FOR STEEL COLUMNS
ENCASED IN STRUCTURAL LIGHTWEIGHT CONCRETE^a
[FIGURE 721.5.1(6)(c)]

STRUCTURAL SHAPE	FIRE-RESISTANCE RATING (HOURS)					
	1	1 1/2	2	3	4	
W14 × 233	1	1	1	1	1 1/2	
× 193				1 1/2	2	
× 74						
× 61				1 1/2	2	2 1/2
× 43						
W12 × 65	1	1	1	1 1/2	2	
× 53				2	2 1/2	
× 40						
W10 × 112	1	1	1	1 1/2	2	
× 88				2	2 1/2	
× 60						
× 33				1 1/2	2	2 1/2
W8 × 35	1	1	1 1/2	2	3	
× 28				2 1/2	3	
× 24						
× 18				1 1/2	2 1/2	

For SI: 1 inch = 25.4 mm.

a. The tabulated thicknesses are based upon the assumed properties of structural lightweight concrete given in Table 721.5.1(2).

TABLE 721.5.1(9)
MINIMUM COVER (inch) FOR STEEL COLUMNS
IN NORMAL-WEIGHT PRECAST COVERS^a
[FIGURE 721.5.1(6)(a)]

STRUCTURAL SHAPE	FIRE-RESISTANCE RATING (hours)					
	1	1 1/2	2	3	4	
W14 × 233	1 1/2		1 1/2	2 1/2	3	
× 211					1 1/2	2
× 176			2	3		
× 145					2 1/2	3 1/2
× 109		3	4	5		
× 99					4	5
× 61		5	6	7		
× 43					6	7
W12 × 190		1 1/2	1 1/2	2		
× 152					2	3
× 120	3		4	5		
× 96					4	5
× 87	5		6	7		
× 58					6	7
× 40	7		8	9		
W10 × 112					1 1/2	1 1/2
× 88	2		3	4		
× 77						3
× 54	4	5	6	7		
× 33						5
W8 × 67	1 1/2	1 1/2	2	3		
× 58						2
× 48		3	4	5		
× 28						4
× 21		5	6	7		
× 18					6	7
W6 × 25		1 1/2	1 1/2	2		
× 20					2	3
× 16			3	4		
× 12					4	5
× 9	5		6	7		

For SI: 1 inch = 25.4 mm.

a. The tabulated thicknesses are based upon the assumed properties of normal-weight concrete given in Table 721.5.1(2).

TABLE 721.5.1(10)
MINIMUM COVER (inch) FOR STEEL COLUMNS
IN STRUCTURAL LIGHTWEIGHT PRECAST COVERS^a
[FIGURE 721.5.1(6)(a)]

STRUCTURAL SHAPE	FIRE-RESISTANCE RATING (hours)							
	1	1 1/2	2	3	4			
W14 × 233	1 1/2	1 1/2	1 1/2	2	2 1/2			
× 176					3	4	5	
× 145				4				5
× 132					5	6	7	
× 109			6	7				8
× 99					7	8	9	
× 68			8	9				10
× 43					9	10	11	
W12 × 190			1 1/2	1 1/2				1 1/2
× 152					2	3	4	
× 136	3	4						5
× 106					4	5	6	
× 96	5	6						7
× 87					6	7	8	
× 65	7	8						9
× 40					8	9	10	
W10 × 112	1 1/2	1 1/2						1 1/2
× 100					2	3	4	
× 88			3	4				5
× 77					4	5	6	
× 60			5	6				7
× 39					6	7	8	
× 33			7	8				9
W8 × 67					1 1/2	1 1/2	1 1/2	
× 48			2	3				4
× 35							3	
× 28	4	5	6	7				
× 18							5	6
W6 × 25	1 1/2	1 1/2	1 1/2	2				
× 15							2	3
× 9			3	4				

For SI: 1 inch = 25.4 mm.

a. The tabulated thicknesses are based upon the assumed properties of structural lightweight concrete given in Table 721.5.1(2).

assemblies, provided the thickness of the fire-resistant material is adjusted in accordance with the following expression:

$$h_2 = h_1 [(W_1 / D_1) + 0.60] / [(W_2 / D_2) + 0.60]$$

(Equation 7-17)

where:

h = Thickness of spray-applied fire-resistant material in inches.

W = Weight of the structural steel beam or girder in pounds per linear foot.

D = Heated perimeter of the structural steel beam in inches.

Subscript 1 refers to the beam and fire-resistant material thickness in the approved assembly.

Subscript 2 refers to the substitute beam or girder and the required thickness of fire-resistant material.

The fire resistance of structural steel beams and girders protected with intumescent or mastic fire-resistant coatings shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

721.5.2.2.1 Minimum thickness. The use of Equation 7-17 is subject to the following conditions:

1. The weight-to-heated-perimeter ratio for the substitute beam or girder (W_2/D_2) shall not be less than 0.37.
2. The thickness of fire protection materials calculated for the substitute beam or girder (T_f) shall not be less than $3/8$ inch (9.5 mm).
3. The unrestrained or restrained beam rating shall not be less than 1 hour.
4. When used to adjust the material thickness for a restrained beam, the use of this procedure is limited to steel sections classified as compact in accordance with the *AISC Specification for Structural Steel Buildings*, (AISC 360-05).

721.5.2.3 Structural steel trusses. The fire resistance of structural steel trusses protected with fire-resistant materials spray-applied to each of the individual truss elements shall be permitted to be determined in accordance with this section. The thickness of the fire-resistant material shall be determined in accordance with Section 721.5.1.3. The weight-to-heated-perimeter ratio (W/D) of truss elements that can be simultaneously exposed to fire on all sides shall be determined on the same basis as columns, as specified in Section 721.5.1.1. The weight-to-heated-perimeter ratio (W/D) of truss elements that directly support floor or roof construction shall be determined on the same basis as beams and girders, as specified in Section 721.5.2.1.

The fire resistance of structural steel trusses protected with intumescent or mastic fire-resistant coatings shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

721.6 Wood assemblies. The provisions of this section contain procedures by which the fire-resistance ratings of wood assemblies are established by calculations.

721.6.1 General. This section contains procedures for calculating the fire-resistance ratings of walls, floor/ceiling and roof/ceiling assemblies based in part on the standard method of testing referenced in Section 703.2.

721.6.1.1 Maximum fire-resistance rating. Fire-resistance ratings calculated using the procedures in this section shall be used only for 1-hour rated assemblies.

721.6.1.2 Dissimilar membranes. Where dissimilar membranes are used on a wall assembly, the calculation shall be made from the least fire-resistant (weaker) side.

721.6.2 Walls, floors and roofs. These procedures apply to both load-bearing and nonload-bearing assemblies.

721.6.2.1 Fire-resistance rating of wood frame assemblies. The fire-resistance rating of a wood frame assembly is equal to the sum of the time assigned to the membrane on the fire-exposed side, the time assigned to the framing members and the time assigned for additional contribution by other protective measures such as insulation. The membrane on the unexposed side shall not be included in determining the fire resistance of the assembly.

TABLE 721.6.2(1)
TIME ASSIGNED TO WALLBOARD MEMBRANES^{a,b,c,d}

DESCRIPTION OF FINISH	TIME ^e (minutes)
$3/8$ -inch wood structural panel bonded with exterior glue	5
$15/32$ -inch wood structural panel bonded with exterior glue	10
$19/32$ -inch wood structural panel bonded with exterior glue	15
$3/8$ -inch gypsum wallboard	10
$1/2$ -inch gypsum wallboard	15
$5/8$ -inch gypsum wallboard	30
$1/2$ -inch Type X gypsum wallboard	25
$5/8$ -inch Type X gypsum wallboard	40
Double $3/8$ -inch gypsum wallboard	25
$1/2$ - + $3/8$ -inch gypsum wallboard	35
Double $1/2$ -inch gypsum wallboard	40

For SI: 1 inch = 25.4 mm.

- a. These values apply only when membranes are installed on framing members which are spaced 16 inches o.c.
- b. Gypsum wallboard installed over framing or furring shall be installed so that all edges are supported, except $5/8$ -inch Type X gypsum wallboard shall be permitted to be installed horizontally with the horizontal joints staggered 24 inches each side and unsupported but finished.
- c. On wood frame floor/ceiling or roof/ceiling assemblies, gypsum board shall be installed with the long dimension perpendicular to framing members and shall have all joints finished.
- d. The membrane on the unexposed side shall not be included in determining the fire resistance of the assembly. When dissimilar membranes are used on a wall assembly, the calculation shall be made from the least fire-resistant (weaker) side.
- e. The time assigned is not a finished rating.

721.6.2.2 Time assigned to membranes. Table 721.6.2(1) indicates the time assigned to membranes on the fire-exposed side.

721.6.2.3 Exterior walls. For an exterior wall having more than 5 feet (1524 mm) of horizontal separation, the wall is assigned a rating dependent on the interior membrane and the framing as described in Tables 721.6.2(1) and 721.6.2(2). The membrane on the outside of the nonfire-exposed side of exterior walls having more than 5 feet (1524 mm) of horizontal separation may consist of sheathing, sheathing paper, and siding as described in Table 721.6.2(3).

721.6.2.4 Floors and roofs. In the case of a floor or roof, the standard test provides only for testing for fire exposure from below. Except as noted in Section 703.3, Item 5, floor or roof assemblies of wood framing shall have an upper membrane consisting of a subfloor and finished floor conforming to Table 721.6.2(4) or any other membrane that has a contribution to fire resistance of at least 15 minutes in Table 721.6.2(1).

721.6.2.5 Additional protection. Table 721.6.2(5) indicates the time increments to be added to the fire resistance where glass fiber, rockwool, slag mineral wool, or cellulose insulation is incorporated in the assembly.

721.6.2.6 Fastening. Fastening of wood frame assemblies and the fastening of membranes to the wood framing members shall be done in accordance with Chapter 23.

721.6.3 Design of fire-resistant exposed wood members. The fire-resistance rating, in minutes, of timber beams and columns with a minimum nominal dimension of 6 inches (152 mm) is equal to:

**TABLE 721.6.2(1)
TIME ASSIGNED TO WALLBOARD MEMBRANES^{a,b,c,d}**

DESCRIPTION OF FINISH	TIME ^o (minutes)
³ / ₈ -inch wood structural panel bonded with exterior glue	5
¹⁵ / ₃₂ -inch wood structural panel bonded with exterior glue	10
¹⁹ / ₃₂ -inch wood structural panel bonded with exterior glue	15
³ / ₈ -inch gypsum wallboard	10
¹ / ₂ -inch gypsum wallboard	15
⁵ / ₈ -inch gypsum wallboard	30
¹ / ₂ -inch Type X gypsum wallboard	25
⁵ / ₈ -inch Type X gypsum wallboard	40
Double ³ / ₈ -inch gypsum wallboard	25
¹ / ₂ - + ³ / ₈ -inch gypsum wallboard	35
Double ¹ / ₂ -inch gypsum wallboard	40

For SI: 1 inch = 25.4 mm.

- a. These values apply only when membranes are installed on framing members which are spaced 16 inches o.c.
- b. Gypsum wallboard installed over framing or furring shall be installed so that all edges are supported, except ⁵/₈-inch Type X gypsum wallboard shall be permitted to be installed horizontally with the horizontal joints staggered 24 inches each side and unsupported but finished.
- c. On wood frame floor/ceiling or roof/ceiling assemblies, gypsum board shall be installed with the long dimension perpendicular to framing members and shall have all joints finished.
- d. The membrane on the unexposed side shall not be included in determining the fire resistance of the assembly. When dissimilar membranes are used on a wall assembly, the calculation shall be made from the least fire-resistant (weaker) side.
- e. The time assigned is not a finished rating.

**TABLE 721.6.2(2)
TIME ASSIGNED FOR CONTRIBUTION OF WOOD FRAME^{a,b,c}**

DESCRIPTION	TIME ASSIGNED TO FRAME (minutes)
Wood studs 16 inches o.c.	20
Wood floor and roof joists 16 inches o.c.	10

For SI: 1 inch = 25.4 mm.

- a. This table does not apply to studs or joists spaced more than 16 inches o.c.
- b. All studs shall be nominal 2 × 4 and all joists shall have a nominal thickness of at least 2 inches.
- c. Allowable spans for joists shall be determined in accordance with Sections 2308.8, 2308.10.2 and 2308.10.3.

**TABLE 721.6.2(3)
MEMBRANE^a ON EXTERIOR FACE OF WOOD STUD WALLS**

SHEATHING	PAPER	EXTERIOR FINISH
⁵ / ₈ -inch T & G lumber	Sheathing paper	Lumber siding
⁵ / ₁₆ -inch exterior glue wood structural panel		Wood shingles and shakes
¹ / ₂ -inch gypsum wallboard		¹ / ₄ -inch wood structural panels—exterior type
⁵ / ₈ -inch gypsum wallboard		¹ / ₄ -inch hardboard
¹ / ₂ -inch fiberboard		Metal siding
None	—	Stucco on metal lath
		Masonry veneer
None	—	³ / ₈ -inch exterior-grade wood structural panels

For SI: 1 pound/cubic foot = 16.0185 kg/m².

- a. Any combination of sheathing, paper and exterior finish is permitted.

TABLE 721.6.2(4)
FLOORING OR ROOFING OVER WOOD FRAMING^a

ASSEMBLY	STRUCTURAL MEMBERS	SUBFLOOR OR ROOF DECK	FINISHED FLOORING OR ROOFING
Floor	Wood	15/32-inch wood structural panels or 1 1/16 inch T & G softwood	Hardwood or softwood flooring on building paper resilient flooring, parquet floor felted-synthetic fiber floor coverings, carpeting, or ceramic tile on 3/8-inch-thick panel-type underlay Ceramic tile on 1 1/4-inch mortar bed
Roof	Wood	15/32-inch wood structural panels or 1 1/16 inch T & G softwood	Finished roofing material with or without insulation

For SI: 1 inch = 25.4 mm.

a. This table applies only to wood joist construction. It is not applicable to wood truss construction.

TABLE 721.6.2(5)
TIME ASSIGNED FOR ADDITIONAL PROTECTION

DESCRIPTION OF ADDITIONAL PROTECTION	FIRE RESISTANCE (minutes)
Add to the fire-resistance rating of wood stud walls if the spaces between the studs are completely filled with glass fiber mineral wool batts weighing not less than 2 pounds per cubic foot (0.6 pound per square foot of wall surface) or rockwool or slag material wool batts weighing not less than 3.3 pounds per cubic foot (1 pound per square foot of wall surface), or cellulose insulation having a nominal density not less than 2.6 pounds per cubic foot.	15

For SI: 1 pound/cubic foot = 16.0185 kg/m³.

Beams: 2.54Zb [4 -2(b/d)] for beams which may be exposed to fire on four sides.

(Equation 7-18)

2.54Zb [4 -(b/d)] for beams which may be exposed to fire on three sides.

(Equation 7-19)

Columns: 2.54Zd [3 -(d/b)] for columns which may be exposed to fire on four sides

(Equation 7-20)

2.54Zd [3 -(d/2b)] for columns which may be exposed to fire on three sides.

(Equation 7-21)

where:

b = The breadth (width) of a beam or larger side of a column before exposure to fire (inches).

d = The depth of a beam or smaller side of a column before exposure to fire (inches).

Z = Load factor, based on Figure 721.6.3(1).

721.6.3.1 Equation 7-21. Equation 7-21 applies only where the unexposed face represents the smaller side of the column. If a column is recessed into a wall, its full dimension shall be used for the purpose of these calculations.

721.6.3.2 Allowable loads. Allowable loads on beams and columns are determined using design values given in AF&PA NDS.

721.6.3.3 Fastener protection. Where minimum 1-hour fire resistance is required, connectors and fasteners shall be protected from fire exposure by 1 1/2 inches (38 mm) of wood, or other approved covering or coating for a 1-hour rating. Typical details for commonly used fasteners and connectors are shown in AITC Technical Note 7.

721.6.3.4 Minimum size. Wood members are limited to dimensions of 6 inches (152 mm) nominal or greater. Glued-laminated timber beams utilize standard laminating combinations except that a core lamination is removed. The tension zone is moved inward and the equivalent of an extra nominal 2-inch-thick (51 mm) outer tension lamination is added.

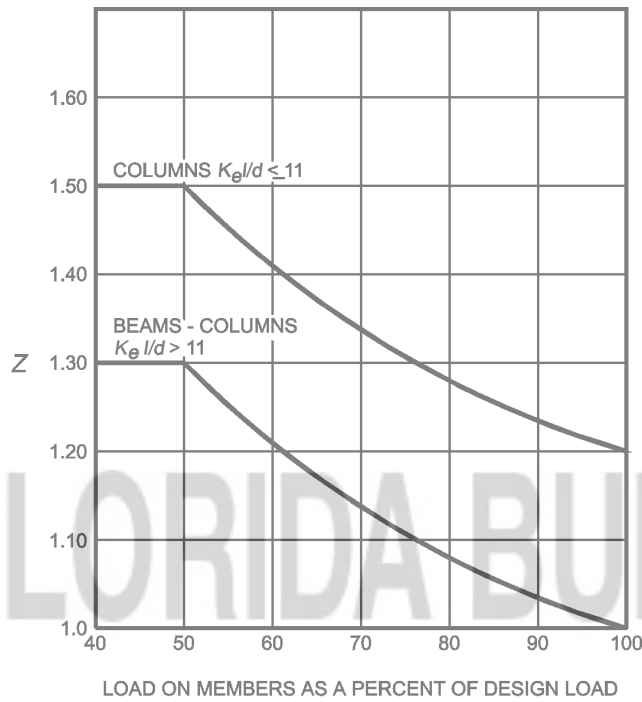


FIGURE 721.6.3(1)
LOAD FIGURE

K_e = The effective length factor as noted in Figure 721.6.3(2).
 l = The unsupported length of columns (inches).

BUCKLING MODES						
THEORETICAL K_e VALUE	0.5	0.7	1.0	1.0	2.0	2.0
RECOMMENDED DESIGN K_e WHEN IDEAL CONDITIONS APPROXIMATED	0.65	0.80	1.2	1.0	2.10	2.4
END CONDITION CODE						
	ROTATION FIXED, TRANSLATION FIXED					
	ROTATION FREE, TRANSLATION FIXED					
	ROTATION FIXED, TRANSLATION FREE					
	ROTATION FREE, TRANSLATION FREE					

FIGURE 721.6.3(2)
EFFECTIVE LENGTH FACTORS

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CHAPTER 8

INTERIOR FINISHES

SECTION 801 GENERAL

801.1 Scope. Provisions of this chapter shall govern the use of materials used as interior finishes, trim and decorative materials.

801.1.1 Interior finishes. These provisions shall limit the allowable flame spread and smoke development based on location and occupancy classification.

Exceptions:

1. Materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls or ceilings.
2. Exposed portions of structural members complying with the requirements for buildings of Type IV construction in Section 602.4 shall not be subject to interior finish requirements.

[F] 801.1.2 Decorative materials and trim. Decorative materials and trim shall be restricted by combustibility and the flame propagation performance criteria of NFPA 701, in accordance with Section 806.

801.1.3 Applicability. For buildings in flood hazard areas as established in Section 1612.3, interior finishes, trim and decorative materials below the design flood elevation shall be flood-damage-resistant materials.

801.2 Application. Combustible materials shall be permitted to be used as finish for walls, ceilings, floors and other interior surfaces of buildings.

801.2.1 Windows. Show windows in the exterior walls of the first story above grade shall be permitted to be of wood or of unprotected metal framing.

801.2.2 Foam plastics. Foam plastics shall not be used as interior finish or trim except as provided in Section 2603.9 or 2604. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover.

SECTION 802 DEFINITIONS

802.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EXPANDED VINYL WALL COVERING. Wall covering consisting of a woven textile backing, an expanded vinyl base coat layer and a nonexpanded vinyl skin coat. The expanded base coat layer is a homogeneous vinyl layer that contains a blowing agent. During processing, the blowing agent decomposes, causing this layer to expand by forming closed cells. The total thickness of the wall covering is approximately 0.055 inch to 0.070 inch (1.4 mm to 1.78 mm).

FLAME SPREAD. The propagation of flame over a surface.

FLAME SPREAD INDEX. A comparative measure, expressed as a dimensionless number, derived from visual measurements of the spread of flame versus time for a material tested in accordance with ASTM E 84.

INTERIOR FINISH. Interior finish includes interior wall and ceiling finish and interior floor finish.

INTERIOR FLOOR FINISH. The exposed floor surfaces of buildings including coverings applied over a finished floor or stair, including risers.

INTERIOR WALL AND CEILING FINISH. The exposed interior surfaces of buildings, including but not limited to: fixed or movable walls and partitions; toilet room privacy partitions; columns; ceilings; and interior wainscoting, paneling or other finish applied structurally or for decoration, acoustical correction, surface insulation, structural fire resistance or similar purposes, but not including trim.

SMOKE-DEVELOPED INDEX. A comparative measure, expressed as a dimensionless number, derived from measurements of smoke obscuration versus time for a material tested in accordance with ASTM E 84.

TRIM. Picture molds, chair rails, baseboards, handrails, door and window frames and similar decorative or protective materials used in fixed applications.

SECTION 803 WALL AND CEILING FINISHES

803.1 General. Interior wall and ceiling finishes shall be classified in accordance with ASTM E 84. Such interior finish materials shall be grouped in the following classes in accordance with their flame spread and smoke-developed indexes.

Class A: Flame spread 0-25; smoke-developed 0-450.

Class B: Flame spread 26-75; smoke-developed 0-450.

Class C: Flame spread 76-200; smoke-developed 0-450.

Exception: Materials, other than textiles, tested in accordance with Section 803.2.

803.2 Interior wall or ceiling finishes other than textiles. Interior wall or ceiling finishes, other than textiles, shall be permitted to be tested in accordance with NFPA 286. Finishes tested in accordance with NFPA 286 shall comply with Section 803.2.1.

803.2.1 Acceptance criteria. During the 40 kW exposure, the interior finish shall comply with Item 1. During the 160 kW exposure, the interior finish shall comply with Item 2. During the entire test, the interior finish shall comply with Items 3 and 4.

1. During the 40 kW exposure, flames shall not spread to the ceiling.

2. During the 160 kW exposure, the interior finish shall comply with the following:
 - 2.1. Flame shall not spread to the outer extremity of the sample on any wall or ceiling.
 - 2.2. Flashover, as defined in NFPA 286, shall not occur.
3. The peak rate of heat release throughout the NFPA 286 test shall not exceed 800 kW.
4. The total smoke released throughout the NFPA 286 test shall not exceed 1,000 m².

803.3 Stability. Interior finish materials regulated by this chapter shall be applied or otherwise fastened in such a manner that such materials will not readily become detached where subjected to room temperatures of 200°F (93°C) for not less than 30 minutes.

803.4 Application. Where these materials are applied on walls, ceilings or structural elements required to have a fire-resistance rating or to be of noncombustible construction, they shall comply with the provisions of this section.

803.4.1 Direct attachment and furred construction.

Where walls and ceilings are required by any provision in this code to be of fire-resistance-rated or noncombustible construction, the interior finish material shall be applied directly against such construction or to furring strips not exceeding 1.75 inches (44 mm) applied directly against such surfaces. The intervening spaces between such furring strips shall be filled with inorganic or Class A material or shall be fireblocked at a maximum of 8 feet (2438 mm) in any direction in accordance with Section 717.

803.4.2 Set-out construction.

Where walls and ceilings are required to be of fire-resistance-rated or noncombustible construction and walls are set out or ceilings are dropped distances greater than specified in Section 803.4.1, Class A finish materials shall be used except where interior finish materials are protected on both sides by an automatic sprinkler system or attached to noncombustible backing or furring strips installed as specified in Section 803.4.1. The hangers and assembly members of such dropped ceilings that are below the main ceiling line shall be of noncombustible materials, except that in Type III and V construction, fire-retardant-treated wood shall be permitted. The construction of each set-out wall shall be of fire-resistance-rated construction as required elsewhere in this code.

803.4.3 Heavy timber construction.

Wall and ceiling finishes of all classes as permitted in this chapter that are installed directly against the wood decking or planking of Type IV construction or to wood furring strips applied directly to the wood decking or planking shall be fireblocked as specified in Section 803.4.1.

803.4.4 Materials.

An interior wall or ceiling finish that is not more than 0.25 inch (6.4 mm) thick shall be applied directly against a noncombustible backing.

Exceptions:

1. Class A materials.

2. Materials where the qualifying tests were made with the material suspended or furred out from the noncombustible backing.

803.5 Interior finish requirements based on group.

Interior wall and ceiling finish shall have a flame spread index not greater than that specified in Table 803.5 for the group and location designated. Interior wall and ceiling finish materials, other than textiles, tested in accordance with NFPA 286 and meeting the acceptance criteria of Section 803.2.1, shall be permitted to be used where a Class A classification in accordance with ASTM E 84 is required.

803.6 Textiles.

Where used as interior wall or ceiling finish materials, textiles, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall comply with the requirements of Section 803.6.1, 803.6.2 or 803.6.3.

803.6.1 Surface burning characteristic test.

Textile wall and ceiling coverings shall have a Class A flame spread index in accordance with ASTM E 84 and be protected by automatic sprinklers installed in accordance with Section 903.3.1.1 or 903.3.1.2.

803.6.2 Room corner test, textiles.

Textile wall coverings shall meet the criteria of Section 803.6.2.1 when tested in the manner intended for use in accordance with the Method B protocol of NFPA 265 using the product-mounting system, including adhesive.

803.6.2.1 Method B test protocol.

During the 40 kW exposure, the interior finish shall comply with Item 1. During the 150 kW exposure, the interior finish shall comply with Item 2. During the entire test, the interior finish shall comply with Item 3.

1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. During the 150 kW exposure, the interior finish shall comply with the following:
 - 2.1. Flame shall not spread to the outer extremities of the samples on the 8-foot by 12-foot (203 mm by 305 mm) walls.
 - 2.2. Flashover, as described in NFPA 265, shall not occur.
3. The total smoke released throughout the NFPA 265 test shall not exceed 1000 m².

803.6.3 Room corner test, ceiling and wall finish.

Textile wall and ceiling coverings shall meet the criteria of Section 803.2.1 when tested in the manner intended for use in accordance with NFPA 286 using the product-mounting system, including adhesive.

803.7 Expanded vinyl wall coverings.

Expanded vinyl wall coverings shall comply with the requirements for textile wall and ceiling materials and their use shall comply with Section 803.6.

Exception: Expanded vinyl wall or ceiling coverings complying with Section 803.2 shall not be required to comply with Section 803.1 or 803.6.

**TABLE 803.5
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY^k**

GROUP	SPRINKLERED ^l			NONSPRINKLERED		
	Exit enclosures and exit passageways ^{a,b}	Corridors	Rooms and enclosed spaces ^c	Exit enclosures and exit passageways ^{a,b}	Corridors	Rooms and enclosed spaces ^c
A-1 & A-2	B	B	C	A	A ^d	B ^e
A-3 ^f , A-4, A-5	B	B	C	A	A ^d	C
B, D, E, M, R-1, R-4	B	C	C	A	B	C
F	C	C	C	B	C	C
H	B	B	C ^g	A	A	B
I-1	B	C	C	A	B	B
I-2	B	B	B ^{h, i}	A	A	B
I-3	A	A ^j	C	A	A	B
R-2	C	C	C	B	B	C
R-3	C	C	C	C	C	C
S	C	C	C	B	B	C
U	No restrictions			No restrictions		

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m².

- a. Class C interior finish materials shall be permitted for wainscoting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fireblocked as required by Section 803.4.1.
- b. In exit enclosures of buildings less than three stories in height of other than Group I-3, Class B interior finish for nonsprinklered buildings and Class C interior finish for sprinklered buildings shall be permitted.
- c. Requirements for rooms and enclosed spaces shall be based upon spaces enclosed by partitions. Where a fire-resistance rating is required for structural elements, the enclosing partitions shall extend from the floor to the ceiling. Partitions that do not comply with this shall be considered enclosing spaces and the rooms or spaces on both sides shall be considered one. In determining the applicable requirements for rooms and enclosed spaces, the specific occupancy thereof shall be the governing factor regardless of the group classification of the building or structure.
- d. Lobby areas in Group A-1, A-2 and A-3 occupancies shall not be less than Class B materials.
- e. Class C interior finish materials shall be permitted in places of assembly with an occupant load of 300 persons or less.
- f. For places of religious worship, wood used for ornamental purposes, trusses, paneling or chancel furnishing shall be permitted.
- g. Class B material is required where the building exceeds two stories.
- h. Class C interior finish materials shall be permitted in administrative spaces.
- i. Class C interior finish materials shall be permitted in rooms with a capacity of four persons or less.
- j. Class B materials shall be permitted as wainscoting extending not more than 48 inches above the finished floor in corridors.
- k. Finish materials as provided for in other sections of this code.
- l. Applies when the exit enclosures, exit passageways, corridors or rooms and enclosed spaces are protected by a sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

803.8 Insulation. Thermal and acoustical insulation shall comply with Section 719.

803.9 Acoustical ceiling systems. The quality, design, fabrication and erection of metal suspension systems for acoustical tile and lay-in panel ceilings in buildings or structures shall conform with generally accepted engineering practice, the provisions of this chapter and other applicable requirements of this code.

803.9.1 Materials and installation. Acoustical materials complying with the interior finish requirements of Section 803 shall be installed in accordance with the manufacturer’s recommendations and applicable provisions for applying interior finish.

803.9.1.1 Suspended acoustical ceilings. Suspended acoustical ceiling systems shall be installed in accordance with the provisions of ASTM C 635 and ASTM C 636.

803.9.1.2 Fire-resistance-rated construction. Acoustical ceiling systems that are part of fire-resistance-rated construction shall be installed in the same manner used in the assembly tested and shall comply with the provisions of Chapter 7.

**SECTION 804
INTERIOR FLOOR FINISH**

804.1 General. Interior floor finish and floor covering materials shall comply with Sections 804.2 through 804.4.1.

Exception: Floor finishes and coverings of a traditional type, such as wood, vinyl, linoleum or terrazzo, and resilient floor covering materials that are not comprised of fibers.

804.2 Classification. Interior floor finish and floor covering materials required by Section 804.4.1 to be of Class I or II materials shall be classified in accordance with NFPA 253. The classification referred to herein corresponds to the classifica-

tions determined by NFPA 253 as follows: Class I, 0.45 watts/cm² or greater; Class II, 0.22 watts/cm² or greater.

804.3 Testing and identification. Interior floor finish and floor covering materials shall be tested by an approved agency in accordance with NFPA 253 and identified by a hang tag or other suitable method so as to identify the manufacturer or supplier and style, and shall indicate the interior floor finish or floor covering classification according to Section 804.2. Carpet-type floor coverings shall be tested as proposed for use, including underlayment. Test reports confirming the information provided in the manufacturer’s product identification shall be furnished to the building official upon request.

804.4 Interior floor finish requirements. In all occupancies, interior floor finish and floor covering materials in exit enclosures, exit passageways, corridors and rooms or spaces not separated from corridors by full-height partitions extending from the floor to the underside of the ceiling shall withstand a minimum critical radiant flux as specified in Section 804.4.1.

804.4.1 Minimum critical radiant flux. Interior floor finish and floor covering materials in exit enclosures, exit passageways and corridors shall not be less than Class I in Groups I-2 and I-3 and not less than Class II in Groups A, B, E, H, I-4, M, R-1, R-2 and S. In all areas, floor covering materials shall comply with the DOC FF-1 “pill test” (CPSC 16 CFR, Part 1630).

Exception: Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, Class II materials are permitted in any area where Class I materials are required, and materials complying with the DOC FF-1 “pill test” (CPSC 16 CFR, Part 1630) are permitted in any area where Class II materials are required.

**SECTION 805
COMBUSTIBLE MATERIALS IN TYPES I AND II
CONSTRUCTION**

805.1 Application. Combustible materials installed on or embedded in floors of buildings of Type I or II construction shall comply with Sections 805.1.1 through 805.1.3.

Exception: Stages and platforms constructed in accordance with Sections 410.3 and 410.4, respectively.

805.1.1 Subfloor construction. Floor sleepers, bucks and nailing blocks shall not be constructed of combustible materials, unless the space between the fire-resistance-rated floor construction and the flooring is either solidly filled with approved noncombustible materials or fireblocked in accordance with Section 717, and provided that such open spaces shall not extend under or through permanent partitions or walls.

805.1.2 Wood finish flooring. Wood finish flooring is permitted to be attached directly to the embedded or fireblocked wood sleepers and shall be permitted where cemented directly to the top surface of approved fire-resistance-rated floor construction or directly to a wood subfloor attached to sleepers as provided for in Section 805.1.1.

805.1.3 Insulating boards. Combustible insulating boards not more than 1/2 inch (12.7 mm) thick and covered with approved finish flooring are permitted where attached directly to a noncombustible floor assembly or to wood subflooring attached to sleepers as provided for in Section 805.1.1.

**[F] SECTION 806
DECORATIVE MATERIALS AND TRIM**

[F] 806.1 General requirements. In occupancies in Groups A, E, I and R-1 and dormitories in Group R-2, curtains, draperies, hangings and other decorative materials suspended from walls or ceilings shall meet the flame propagation performance criteria of NFPA 701 in accordance with Section 806.2 or be noncombustible.

In Groups I-1 and I-2, combustible decorative materials shall meet the flame propagation criteria of NFPA 701 unless the decorative materials, including, but not limited to, photographs and paintings, are of such limited quantities that a hazard of fire development or spread is not present. In Group I-3, combustible decorative materials are prohibited.

Fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes shall be considered interior finish if they cover 10 percent or more of the wall or of the ceiling area, and shall not be considered decorative materials or furnishings.

In Group B and M occupancies, fabric partitions suspended from the ceiling and not supported by the floor shall meet the flame propagation performance criteria in accordance with Section 806.2 and NFPA 701 or shall be noncombustible.

[F] 806.1.1 Noncombustible materials. The permissible amount of noncombustible decorative material shall not be limited.

[F] 806.1.2 Combustible decorative materials. The permissible amount of decorative materials meeting the flame propagation performance criteria of NFPA 701 shall not exceed 10 percent of the aggregate area of walls and ceilings.

Exceptions:

1. In auditoriums in Group A, the permissible amount of decorative material meeting the flame propagation performance criteria of NFPA 701 shall not exceed 50 percent of the aggregate area of walls and ceiling where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and where the material is installed in accordance with Section 803.4.
2. The amount of fabric partitions suspended from the ceiling and not supported by the floor in Group B and M occupancies shall not be limited.

[F] 806.2 Acceptance criteria and reports. Where required by Section 806.1, decorative materials shall be tested by an approved agency and meet the flame propagation performance criteria of NFPA 701 or such materials shall be

noncombustible. Reports of test results shall be prepared in accordance with NFPA 701 and furnished to the building official upon request.

[F] 806.3 Foam plastic. Foam plastic used as trim in any occupancy shall comply with Section 2604.2.

[F] 806.4 Pyroxylin plastic. Imitation leather or other material consisting of or coated with a pyroxylin or similarly hazardous base shall not be used in Group A occupancies.

[F] 806.5 Interior trim. Material, other than foam plastic used as interior trim shall have a minimum Class C flame spread and smoke-developed index when tested in accordance with ASTM E 84, as described in Section 803.1. Combustible trim, excluding handrails and guardrails, shall not exceed 10 percent of the aggregate wall or ceiling area in which it is located.

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CHAPTER 9

FIRE PROTECTION SYSTEMS

SECTION 901 GENERAL

901.1 Scope. The provisions of this chapter shall specify where fire protection systems are required and shall apply to the design, installation and operation of fire protection systems.

901.2 Fire protection systems. Fire protection systems shall be installed, repaired, operated and maintained in accordance with this code and the *Florida Fire Prevention Code*.

Any fire protection system for which an exception or reduction to the provisions of this code has been granted shall be considered to be a required system.

Exception: Any fire protection system or portion thereof not required by this code shall be permitted to be installed for partial or complete protection provided that such system meets the requirements of this code.

901.3 Modifications. No person shall remove or modify any fire protection system installed or maintained under the provisions of this code or the *Florida Fire Prevention Code* without approval by the building official.

901.4 Threads. Threads provided for fire department connections to sprinkler systems, standpipes, yard hydrants or any other fire hose connection shall be compatible with the connections used by the local fire department.

901.5 Acceptance tests. Fire protection systems shall be tested in accordance with the requirements of this code and the *Florida Fire Prevention Code*. When required, the tests shall be conducted in the presence of the building official. Tests required by this code, the *Florida Fire Prevention Code* and the standards listed in this code shall be conducted at the expense of the owner or the owner's representative. It shall be unlawful to occupy portions of a structure until the required fire protection systems within that portion of the structure have been tested and approved.

901.6 Supervisory service. Where required, fire protection systems shall be monitored by an approved supervising station in accordance with NFPA 72.

901.6.1 Automatic sprinkler systems. Automatic sprinkler systems shall be monitored for integrity in accordance with NFPA 72, *National Fire Alarm Code*.

Exceptions:

1. A supervising station is not required for automatic sprinkler systems protecting one- and two-family dwellings.
2. Limited area systems serving fewer than 20 sprinklers.

901.6.2 Fire alarm systems. Fire alarm systems required by the provisions of Section 907.2 of this code and the *Florida Fire Prevention Code* shall be monitored by an approved supervising station in accordance with Section 907.14.

Exceptions:

1. Single- and multiple-station smoke alarms required by Section 907.2.10.
2. Smoke detectors in Group I-3 occupancies.
3. Supervisory service is not required for automatic sprinkler systems in one- and two-family dwellings.

901.6.3 Group H. Manual fire alarm, automatic fire-extinguishing and emergency alarm systems in Group H occupancies shall be monitored by an approved supervising station.

Exception: When approved by the building official, on-site monitoring at a constantly attended location shall be permitted provided that notifications to the fire department will be equal to those provided by an approved supervising station.

901.7 Fire areas. Where buildings, or portions thereof, are divided into fire areas so as not to exceed the limits established for requiring a fire protection system in accordance with this chapter, such fire areas shall be separated by fire barriers having a fire-resistance rating of not less than that determined in accordance with Section 706.3.9.

SECTION 902 DEFINITIONS

902.1 Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.

[F] ALARM NOTIFICATION APPLIANCE. A fire alarm system component such as a bell, horn, speaker, light or text display that provides audible, tactile or visible outputs, or any combination thereof.

[F] ALARM SIGNAL. A signal indicating an emergency requiring immediate action, such as a signal indicative of fire.

[F] ALARM VERIFICATION FEATURE. A feature of automatic fire detection and alarm systems to reduce unwanted alarms wherein smoke detectors report alarm conditions for a minimum period of time, or confirm alarm conditions within a given time period, after being automatically reset, in order to be accepted as a valid alarm-initiation signal.

[F] ANNUNCIATOR. A unit containing one or more indicator lamps, alphanumeric displays or other equivalent means in which each indication provides status information about a circuit, condition or location.

[F] AUDIBLE ALARM NOTIFICATION APPLIANCE. A notification appliance that alerts by the sense of hearing.

[F] AUTOMATIC. As applied to fire protection devices, is a device or system providing an emergency function without the necessity for human intervention and activated as a result of a

predetermined temperature rise, rate of temperature rise or combustion products.

[F] AUTOMATIC FIRE-EXTINGUISHING SYSTEM. An approved system of devices and equipment which automatically detects a fire and discharges an approved fire-extinguishing agent onto or in the area of a fire.

[F] AUTOMATIC SPRINKLER SYSTEM. A sprinkler system, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply. The portion of the system above the ground is a network of specially sized or hydraulically designed piping installed in a structure or area, generally overhead, and to which automatic sprinklers are connected in a systematic pattern. The system is usually activated by heat from a fire and discharges water over the fire area.

[F] AVERAGE AMBIENT SOUND LEVEL. The root mean square, A-weighted sound pressure level measured over a 24-hour period.

[F] CARBON DIOXIDE EXTINGUISHING SYSTEMS. A system supplying carbon dioxide (CO₂) from a pressurized vessel through fixed pipes and nozzles. The system includes a manual- or automatic-actuating mechanism.

[F] CEILING LIMIT. The maximum concentration of an air-borne contaminant to which one may be exposed, as published in DOL 29 CFR Part 1910.1000.

[F] CLEAN AGENT. Electrically nonconducting, volatile or gaseous fire extinguishant that does not leave a residue upon evaporation.

[F] CONSTANTLY ATTENDED LOCATION. A designated location at a facility staffed by trained personnel on a continuous basis where alarm or supervisory signals are monitored and facilities are provided for notification of the fire department or other emergency services.

[F] DELUGE SYSTEM. A sprinkler system employing open sprinklers attached to a piping system connected to a water supply through a valve that is opened by the operation of a detection system installed in the same areas as the sprinklers. When this valve opens, water flows into the piping system and discharges from all sprinklers attached thereto.

[F] DETECTOR, HEAT. A fire detector that senses heat produced by burning substances. Heat is the energy produced by combustion that causes substances to rise in temperature.

[F] DRY-CHEMICAL EXTINGUISHING AGENT. A powder composed of small particles, usually of sodium bicarbonate, potassium bicarbonate, urea-potassium-based bicarbonate, potassium chloride or monoammonium phosphate, with added particulate material supplemented by special treatment to provide resistance to packing, resistance to moisture absorption (caking) and the proper flow capabilities.

[F] EMERGENCY ALARM SYSTEM. A system to provide indication and warning of emergency situations involving hazardous materials.

[F] EMERGENCY VOICE/ALARM COMMUNICATIONS. Dedicated manual or automatic facilities for originating and distributing voice instructions, as well as alert and

evacuation signals pertaining to a fire emergency, to the occupants of a building.

[F] EXPLOSION. An effect produced by the sudden violent expansion of gases, that is accompanied by a shock wave or disruption of enclosing materials or structures, or both.

[F] FIRE ALARM BOX, MANUAL. See “Manual Fire Alarm Box.”

[F] FIRE ALARM CONTROL UNIT. A system component that receives inputs from automatic and manual fire alarm devices and is capable of supplying power to detection devices and transponder(s) or off-premises transmitter(s). The control unit is capable of providing a transfer of power to the notification appliances and transfer of condition to relays or devices.

[F] FIRE ALARM SIGNAL. A signal initiated by a fire alarm-initiating device such as a manual fire alarm box, automatic fire detector, water flow switch, or other device whose activation is indicative of the presence of a fire or fire signature.

[F] FIRE ALARM SYSTEM. A system or portion of a combination system consisting of components and circuits arranged to monitor and annunciate the status of fire alarm or supervisory signal-initiating devices and to initiate the appropriate response to those signals.

[F] FIRE COMMAND CENTER. The principal attended or unattended location where the status of detection, alarm communications and control systems is displayed, and from which the system(s) can be manually controlled.

[F] FIRE DETECTOR, AUTOMATIC. A device designed to detect the presence of a fire signature and to initiate action.

[F] FIRE PROTECTION SYSTEM. Approved devices, equipment and systems or combinations of systems used to detect a fire, activate an alarm, extinguish or control a fire, control or manage smoke and products of a fire or any combination thereof.

[F] FIRE SAFETY FUNCTIONS. Building and fire control functions that are intended to increase the level of life safety for occupants or to control the spread of harmful effects of fire.

[F] FOAM-EXTINGUISHING SYSTEM. A special system discharging a foam made from concentrates, either mechanically or chemically, over the area to be protected.

[F] HALOGENATED EXTINGUISHING SYSTEM. A fire-extinguishing system using one or more atoms of an element from the halogen chemical series: fluorine, chlorine, bromine and iodine.

[F] INITIATING DEVICE. A system component that originates transmission of a change-of-state condition, such as in a smoke detector, manual fire alarm box or supervisory switch.

[F] LISTED. Equipment, materials or services included in a list published by an organization acceptable to the building official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material or service meets identified standards or has been tested and found suitable for a specified purpose.

[F] MANUAL FIRE ALARM BOX. A manually operated device used to initiate an alarm signal.

[F] MULTIPLE-STATION ALARM DEVICE. Two or more single-station alarm devices that are capable of interconnection such that actuation of one causes all integral or separate audible alarms to operate. It also can consist of one single-station alarm device having connections to other detectors or to a manual fire alarm box.

[F] MULTIPLE-STATION SMOKE ALARM. Two or more single-station alarm devices that are capable of interconnection such that actuation of one causes all integral or separate audible alarms to operate.

[F] NUISANCE ALARM. An alarm caused by mechanical failure, malfunction, improper installation or lack of proper maintenance, or an alarm activated by a cause that cannot be determined.

[F] RECORD DRAWINGS. Drawings (“as built”) that document the location of all devices, appliances, wiring sequences, wiring methods and connections of the components of a fire alarm system as installed.

[F] SINGLE-STATION SMOKE ALARM. An assembly incorporating the detector, the control equipment and the alarm-sounding device in one unit, operated from a power supply either in the unit or obtained at the point of installation.

[F] SMOKE ALARM. A single- or multiple-station alarm responsive to smoke and not connected to a system.

[F] SMOKE DETECTOR. A listed device that senses visible or invisible particles of combustion.

SMOKEPROOF ENCLOSURE. An exit stairway designed and constructed so that the movement of the products of combustion produced by a fire occurring in any part of the building into the enclosure is limited.

[F] STANDPIPE SYSTEM, CLASSES OF. Standpipe classes are as follows:

Class I system. A system providing 2½-inch (64 mm) hose connections to supply water for use by fire departments and those trained in handling heavy fire streams.

Class II system. A system providing 1½-inch (38 mm) hose stations to supply water for use primarily by the building occupants or by the fire department during initial response.

Class III system. A system providing 1½-inch (38 mm) hose stations to supply water for use by building occupants and 2.5-inch (64 mm) hose connections to supply a larger volume of water for use by fire departments and those trained in handling heavy fire streams.

[F] STANDPIPE, TYPES OF. Standpipe types are as follows:

Automatic dry. A dry standpipe system, normally filled with pressurized air, that is arranged through the use of a device, such as dry pipe valve, to admit water into the system piping automatically upon the opening of a hose valve. The water supply for an automatic dry standpipe system shall be capable of supplying the system demand.

Automatic wet. A wet standpipe system that has a water supply that is capable of supplying the system demand automatically.

Manual dry. A dry standpipe system that does not have a permanent water supply attached to the system. Manual dry standpipe systems require water from a fire department pumper to be pumped into the system through the fire department connection in order to meet the system demand.

Manual wet. A wet standpipe system connected to a water supply for the purpose of maintaining water within the system but does not have a water supply capable of delivering the system demand attached to the system. Manual-wet standpipe systems require water from a fire department pumper (or the like) to be pumped into the system in order to meet the system demand.

Semiautomatic dry. A dry standpipe system that is arranged through the use of a device, such as a deluge valve, to admit water into the system piping upon activation of a remote control device located at a hose connection. A remote control activation device shall be provided at each hose connection. The water supply for a semiautomatic dry standpipe system shall be capable of supplying the system demand.

[F] SUPERVISING STATION. A facility that receives signals and at which personnel are in attendance at all times to respond to these signals.

[F] SUPERVISORY SERVICE. The service required to monitor performance of guard tours and the operative condition of fixed suppression systems or other systems for the protection of life and property.

[F] SUPERVISORY SIGNAL. A signal indicating the need of action in connection with the supervision of guard tours, the fire suppression systems or equipment or the maintenance features of related systems.

[F] SUPERVISORY SIGNAL-INITIATING DEVICE. An initiation device, such as a valve supervisory switch, water-level indicator or low-air pressure switch on a dry-pipe sprinkler system, whose change of state signals an off-normal condition and its restoration to normal of a fire protection or life safety system, or a need for action in connection with guard tours, fire suppression systems or equipment or maintenance features of related systems.

[F] TIRES, BULK STORAGE OF. Storage of tires where the area available for storage exceeds 20,000 cubic feet (566 m³).

[F] TROUBLE SIGNAL. A signal initiated by the fire alarm system or device indicative of a fault in a monitored circuit or component.

[F] VISIBLE ALARM NOTIFICATION APPLIANCE. A notification appliance that alerts by the sense of sight.

[F] WET-CHEMICAL EXTINGUISHING SYSTEM. A solution of water and potassium-carbonate-based chemical, potassium-acetate-based chemical or a combination thereof, forming an extinguishing agent.

[F] WIRELESS PROTECTION SYSTEM. A system or a part of a system that can transmit and receive signals without the aid of wire.

[F] ZONE. A defined area within the protected premises. A zone can define an area from which a signal can be received, an

area to which a signal can be sent or an area in which a form of control can be executed.

SECTION 903 AUTOMATIC SPRINKLER SYSTEMS

[F] 903.1 General. Automatic sprinkler systems shall comply with this section.

[F] 903.1.1 Alternative protection. Alternative automatic fire-extinguishing systems complying with Section 904 shall be permitted in lieu of automatic sprinkler protection where recognized by the applicable standard and approved by the fire code official.

[F] 903.2 Where required. Approved automatic sprinkler systems in new buildings and structures shall be provided in the locations described in this section.

Exception: Spaces or areas in telecommunications buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided those spaces or areas are equipped throughout with an automatic fire alarm system and are separated from the remainder of the building by fire barriers consisting of not less than 1-hour fire-resistance-rated walls and 2-hour fire-resistance-rated floor/ceiling assemblies.

[F] 903.2.1 Group A. An automatic sprinkler system shall be provided throughout buildings and portions thereof used as Group A occupancies as provided in this section. For Group A-1, A-2, A-3 and A-4 occupancies, the automatic sprinkler system shall be provided throughout the floor area where the Group A-1, A-2, A-3 or A-4 occupancy is located, and in all floors between the Group A occupancy and the level of exit discharge. For Group A-5 occupancies, the automatic sprinkler system shall be provided in the spaces indicated in Section 903.2.1.5.

[F] 903.2.1.1 Group A-1. An automatic sprinkler system shall be provided for Group A-1 occupancies where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet (1115 m²).
2. The fire area has an occupant load of 300 or more.
3. The fire area is located on a floor other than the level of exit discharge.
4. The fire area contains a multitheater complex.

[F] 903.2.1.2 Group A-2. An automatic sprinkler system shall be provided for Group A-2 occupancies where one of the following conditions exists:

1. The fire area exceeds 5,000 square feet (464.5 m²).
2. The fire area has an occupant load of 100 or more.
3. The fire area is located on a floor other than the level of exit discharge.
4. Nightclubs or similar usage when occupant load is 100 or more.

[F] 903.2.1.3 Group A-3. An automatic sprinkler system shall be provided for Group A-3 occupancies where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet (1115 m²).
2. The fire area has an occupant load of 300 or more.
3. The fire area is located on a floor other than the level of exit discharge.

Exceptions:

1. Areas used exclusively as participant sports areas where the main floor area is located at the same level as the level of exit discharge of the main entrance and exit.
2. Assembly occupancies used primarily for worship with fixed seating and not part of a mixed occupancy.

[F] 903.2.1.4 Group A-4. An automatic sprinkler system shall be provided for Group A-4 occupancies where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet (1115 m²).
2. The fire area has an occupant load of 300 or more.
3. The fire area is located on a floor other than the level of exit discharge.

Exception: Areas used exclusively as participant sports areas where the main floor area is located at the same level as the level of exit discharge of the main entrance and exit.

[F] 903.2.1.5 Group A-5. An automatic sprinkler system shall be provided for Group A-5 occupancies in the following areas: concession stands, retail areas, press boxes and other accessory use areas in excess of 1,000 square feet (93 m²).

[F] 903.2.2 Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E fire areas greater than 20,000 square feet (1858 m²) in area.
2. Throughout every portion of educational buildings below the level of exit discharge.

Exception: An automatic sprinkler system is not required in existing educational buildings unless 50 percent of the aggregate area of the building is being remodeled.

[F] 903.2.3 Group F-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group F-1 occupancy where one of the following conditions exists:

1. Where a Group F-1 fire area exceeds 12,000 square feet (1115 m²);
2. Where a Group F-1 fire area is located more than three stories above grade plane; or

- Where the combined area of all Group F-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).

[F] 903.2.3.1 Woodworking operations. An automatic sprinkler system shall be provided throughout all Group F-1 occupancy fire areas that contain woodworking operations in excess of 2,500 square feet (232 m²) in area which generate finely divided combustible waste or use finely divided combustible materials.

[F] 903.2.4 Group H. Automatic sprinkler systems shall be provided in high-hazard occupancies as required in Sections 903.2.4.1 through 903.2.4.3.

[F] 903.2.4.1 General. An automatic sprinkler system shall be installed in Group H occupancies.

[F] 903.2.4.2 Group H-5. An automatic sprinkler system shall be installed throughout buildings containing Group H-5 occupancies. The design of the sprinkler system shall not be less than that required by this code for the occupancy hazard classifications in accordance with Table 903.2.4.2. Where the design area of the sprinkler system consists of a corridor protected by one row of sprinklers, the maximum number of sprinklers required to be calculated is 13.

**[F] TABLE 903.2.4.2
GROUP H-5 SPRINKLER DESIGN CRITERIA**

LOCATION	OCCUPANCY HAZARD CLASSIFICATION
Fabrication areas	Ordinary Hazard Group 2
Service corridors	Ordinary Hazard Group 2
Storage rooms without dispensing	Ordinary Hazard Group 2
Storage rooms with dispensing	Extra Hazard Group 2
Corridors	Ordinary Hazard Group 2

[F] 903.2.4.3 Pyroxylin plastics. An automatic sprinkler system shall be provided in buildings, or portions thereof, where cellulose nitrate film or pyroxylin plastics are manufactured, stored or handled in quantities exceeding 100 pounds (45 kg).

[F] 903.2.5 Group I. An automatic sprinkler system shall be provided throughout buildings with a Group I fire area.

Exception: An automatic sprinkler system installed in accordance with Section 903.3.1.2 or 903.3.1.3 shall be allowed in Group I-1 facilities.

[F] 903.2.6 Group M. An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

- Where a Group M fire area exceeds 12,000 square feet (1115 m²);
- Where a Group M fire area is located more than three stories above grade plane; or
- Where the combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).

[F] 903.2.6.1 High-piled storage. An automatic sprinkler system shall be provided in accordance with the

Florida Fire Prevention Code in all buildings of Group M where storage of merchandise is in high-piled or rack storage arrays.

[F] 903.2.7 Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.

[F] 903.2.8 Group S-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists:

- A Group S-1 fire area exceeds 12,000 square feet (1115 m²);
- A Group S-1 fire area is located more than three stories above grade plane; or
- The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).

[F] 903.2.8.1 Repair garages. An automatic sprinkler system shall be provided throughout all buildings used as repair garages in accordance with Section 406, as shown:

- Buildings two or more stories in height, including basements, with a fire area containing a repair garage exceeding 10,000 square feet (929 m²).
- One-story buildings with a fire area containing a repair garage exceeding 12,000 square feet (1115 m²).
- Buildings with a repair garage servicing vehicles parked in the basement.

[F] 903.2.8.2 Bulk storage of tires. Buildings and structures where the area for the storage of tires exceeds 20,000 cubic feet (566 m³) shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

[F] 903.2.9 Group S-2. An automatic sprinkler system shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.4 or where located beneath other groups.

Exception: Enclosed parking garages located beneath Group R-3 occupancies.

[F] 903.2.9.1 Commercial parking garages. An automatic sprinkler system shall be provided throughout buildings used for storage of commercial trucks or buses where the fire area exceeds 5,000 square feet (464 m²).

[F] 903.2.10 Windowless stories in all occupancies. An automatic sprinkler system shall be installed in the locations set forth in Sections 903.2.10.1 through 903.2.10.1.3.

Exception: Group R-3 and Group U.

[F] 903.2.10.1 Stories and basements without openings. An automatic sprinkler system shall be installed throughout every story or basement of all buildings where the floor area exceeds 1,500 square feet (139.4 m²) and where there is not provided at least one of the following types of exterior wall openings:

1. Openings below grade that lead directly to ground level by an exterior stairway complying with Section 1009 or an outside ramp complying with Section 1010. Openings shall be located in each 50 linear feet (15 240 mm), or fraction thereof, of exterior wall in the story on at least one side.
2. Openings entirely above the adjoining ground level totaling at least 20 square feet (1.86 m²) in each 50 linear feet (15 240 mm), or fraction thereof, of exterior wall in the story on at least one side.

[F] 903.2.10.1.1 Opening dimensions and access. Openings shall have a minimum dimension of not less than 30 inches (762 mm). Such openings shall be accessible to the fire department from the exterior and shall not be obstructed in a manner that fire fighting or rescue cannot be accomplished from the exterior.

[F] 903.2.10.1.2 Openings on one side only. Where openings in a story are provided on only one side and the opposite wall of such story is more than 75 feet (22 860 mm) from such openings, the story shall be equipped throughout with an approved automatic sprinkler system, or openings as specified above shall be provided on at least two sides of the story.

[F] 903.2.10.1.3 Basements. Where any portion of a basement is located more than 75 feet (22 860 mm) from openings required by Section 903.2.10.1, the basement shall be equipped throughout with an approved automatic sprinkler system.

[F] 903.2.10.2 Rubbish and linen chutes. An automatic sprinkler system shall be installed at the top of rubbish and linen chutes and in their terminal rooms. Chutes extending through three or more floors shall have additional sprinkler heads installed within such chutes at alternate floors. Chute sprinklers shall be accessible for servicing.

[F] 903.2.10.3 Buildings 55 feet or more in height. Reserved.

[F] 903.2.11 During construction. Automatic sprinkler systems required during construction, alteration and demolition operations shall be provided in accordance with the *Florida Fire Prevention Code*.

[F] 903.2.12 Other hazards. Automatic sprinkler protection shall be provided for the hazards indicated in Sections 903.2.12.1 and 903.2.12.2.

[F] 903.2.12.1 Ducts conveying hazardous exhausts. Where required by the *Florida Building Code, Mechanical*, automatic sprinklers shall be provided in ducts conveying hazardous exhaust, or flammable or combustible materials.

Exception: Ducts in which the largest cross-sectional diameter of the duct is less than 10 inches (254 mm).

[F] 903.2.12.2 Commercial cooking operations. An automatic sprinkler system shall be installed in commercial kitchen exhaust hood and duct system where an

automatic sprinkler system is used to comply with Section 904.

[F] 903.2.13 Other required suppression systems. In addition to the requirements of Section 903.2, the provisions indicated in Table 903.2.13 also require the installation of a suppression system for certain buildings and areas.

**[F] TABLE 903.2.13
ADDITIONAL REQUIRED SUPPRESSION SYSTEMS**

SECTION	SUBJECT
402.8	Covered malls
403.2, 403.3	High-rise buildings
404.3	Atriums
405.3	Underground structures
407.5	Group I-2
410.6	Stages
411.4	Special amusement buildings
412.2.5, 412.2.6	Aircraft hangars
415.6.2.4	Group H-2
416.4	Flammable finishes
417.4	Drying rooms
507	Unlimited area buildings
508.2	Incidental use areas
1025.6.2.3	Smoke-protected assembly seating
FFPC	Sprinkler system requirements as set forth in the <i>Florida Fire Prevention Code</i>

[F] 903.3 Installation requirements. Automatic sprinkler systems shall be designed and installed in accordance with Sections 903.3.1 through 903.3.7.

[F] 903.3.1 Standards. Sprinkler systems shall be designed and installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.

[F] 903.3.1.1 NFPA 13 sprinkler systems. Where the provisions of this code require that a building or portion thereof be equipped throughout with an automatic sprinkler system in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Section 903.3.1.1.1.

[F] 903.3.1.1.1 Exempt locations. Automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an approved automatic fire detection system, in accordance with Section 907.2, that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from any room merely because it is damp, of fire-resistance-rated construction or contains electrical equipment.

1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.

2. Any room or space where sprinklers are considered undesirable because of the nature of the contents, when approved by the fire code official.
3. Generator and transformer rooms separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a fire-resistance rating of not less than 2 hours.
4. In rooms or areas that are of noncombustible construction with wholly noncombustible contents.

[F] 903.3.1.2 NFPA 13R sprinkler systems. Where allowed in buildings of Group R, up to and including four stories in height, automatic sprinkler systems shall be installed throughout in accordance with NFPA 13R.

[F] 903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of dwelling units where the building is of Type V construction. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

[F] 903.3.1.3 NFPA 13D sprinkler systems. Where allowed, automatic sprinkler systems in one- and two-family dwellings shall be installed throughout in accordance with NFPA 13D.

903.3.1.4 In Group R4 Small Facilities, an automated sprinkler systems installed in accordance with NFPA 13D or 13R with their scopes shall be permitted, provided the automatic sprinkler system is not be considered an alternative to other requirements of the code.

[F] 903.3.2 Quick-response and residential sprinklers. Where automatic sprinkler systems are required by this code, quick-response or residential automatic sprinklers shall be installed in the following areas in accordance with Section 903.3.1 and their listings:

1. Throughout all spaces within a smoke compartment containing patient sleeping units in Group I-2 in accordance with this code.
2. Dwelling units, and sleeping units in Group R and I-1 occupancies.
3. Light-hazard occupancies as defined in NFPA 13.

[F] 903.3.3 Obstructed locations. Automatic sprinklers shall be installed with due regard to obstructions that will delay activation or obstruct the water distribution pattern. Automatic sprinklers shall be installed in or under covered kiosks, displays, booths, concession stands, or equipment that exceeds 4 feet (1219 mm) in width. Not less than a 3-foot (914 mm) clearance shall be maintained between automatic sprinklers and the top of piles of combustible fibers.

Exception: Kitchen equipment under exhaust hoods protected with a fire-extinguishing system in accordance with Section 904.

[F] 903.3.4 Actuation. Automatic sprinkler systems shall be automatically actuated unless specifically provided for in this code.

[F] 903.3.5 Water supplies. Water supplies for automatic sprinkler systems shall comply with this section and the standards referenced in Section 903.3.1. The potable water supply shall be protected against backflow in accordance with the requirements of this section and the *Florida Building Code, Plumbing*.

[F] 903.3.5.1 Domestic services. Where the domestic service provides the water supply for the automatic sprinkler system, the supply shall be in accordance with this section.

[F] 903.3.5.1.1 Limited area sprinkler systems. Limited area sprinkler systems serving six sprinklers or less on any single connection are permitted to be connected to the domestic service where a wet automatic standpipe is not available. Limited area sprinkler systems connected to domestic water supplies shall comply with each of the following requirements:

1. Valves shall not be installed between the domestic water riser control valve and the sprinklers.

Exception: An approved indicating control valve supervised in the open position in accordance with Section 903.4.

2. The domestic service shall be capable of supplying the simultaneous domestic demand and the sprinkler demand required to be hydraulically calculated by NFPA 13, NFPA 13R or NFPA 13D.

[F] 903.3.5.1.2 Residential combination services. A single combination water supply shall be allowed provided that the domestic demand is added to the sprinkler demand as required by NFPA 13R.

[F] 903.3.5.2 Secondary water supply. Reserved.

[F] 903.3.6 Hose threads. Fire hose threads and fittings used in connection with automatic sprinkler systems shall be as prescribed by the fire code official.

[F] 903.4 Sprinkler system monitoring and alarms. All valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures and water-flow switches on all sprinkler systems shall be electrically supervised in accordance with NFPA 72.

Exceptions:

1. Automatic sprinkler systems protecting one- and two-family dwellings.
2. Limited area systems serving six sprinklers or less.
3. Automatic sprinkler systems installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the automatic sprinkler systems and a separate shutoff valve for the automatic sprinkler system is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.

5. Control valves to commercial kitchen hoods, paint spray booths or dip tanks that are sealed or locked in the open position.
6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.
7. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.

[F] 903.4.1 Signals. Alarm, supervisory and trouble signals shall be distinctly different and automatically transmitted to an approved central station, remote supervising station or proprietary supervising station as defined in NFPA 72 or, when approved by the fire code official, shall sound an audible signal at a constantly attended location.

Exceptions:

1. Underground key or hub valves in roadway boxes provided by the municipality or public utility are not required to be monitored.
2. Backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position. In occupancies required to be equipped with a fire alarm system, the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.

[F] 903.4.2 Alarms. Approved audible devices shall be connected to every automatic sprinkler system. Such sprinkler water-flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Alarm devices shall be provided on the exterior of the building in an approved location. Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system.

[F] 903.4.3 Floor control valves. Approved supervised indicating control valves shall be provided at the point of connection to the riser on each floor in high-rise buildings.

[F] 903.5 Testing and maintenance. Sprinkler systems shall be tested and maintained in accordance with the *Florida Fire Prevention Code*.

903.6 Buildings three stories or more in height.

903.6.1 Any building which is of three stories or more in height shall be equipped with an approved automatic sprinkler system installed in accordance with Section 903.1.

Exceptions:

1. Single- and two-family dwellings.
2. A stand-alone parking garage constructed with noncombustible materials, the design of which is such that all levels of the garage are uniformly open to the atmosphere on all sides with the percentages of openings equal to or greater than those specified in Section 406.3. Such garages shall be separated from any other structure by not less than 20 feet (6096 mm). A stand-alone parking garage is one that is solely for the parking of vehicles and

does not have any other occupancy group in the building.

3. Telecommunication spaces located within telecommunication buildings, if the spaces are equipped to meet an equivalent fire prevention standard approved by both the Florida Building Commission and the State Fire Marshal.
4. Telecommunications spaces within telecommunication buildings, if the telecommunications space is equipped with:
 - 4.1. Air sampling smoke detection.
 - 4.2. Remote, proprietary or central station fire alarm monitoring.
 - 4.3. Automatic smoke exhaust system.
 - 4.4. One-hour fire-resistant wall separating the telecommunications space from the adjacent areas on the same floor.
 - 4.5. Two-hour floor/ceiling assembly separating the telecommunications space from adjacent floors.
 - 4.6. All other portions ancillary to the telecommunications equipment area shall be provided with fire sprinkler protection.
5. Sprinkler systems installed solely as a requirement of Section 903.6 may be a NFPA 13R or NFPA 13D system in accordance with their scopes.

903.6.2 NFPA 101 as adopted by *Florida Fire Prevention Code*, as regarding the requirements for fire protection sprinklers, is applicable to all multiple-family residential buildings, whether designated as townhouses, condominiums, apartment houses, tenements, garden apartments or by any other name. The attorney general has determined that for the purpose of the fire protection sprinkler requirements in Section 553.895(2), *Florida Statutes*, townhouses that are three or more stories tall and consist of three or more units together are multiple-family dwellings. Therefore, these types of townhouses are not exempt from being considered for the requirements to provide fire protection sprinklers (even if there are any other definitions that define a townhouse as a single-family residence). When determining whether townhouses require fire protection sprinkler systems, the building official must consider in parallel: (a) the attorney general's opinion defining the statutory language for townhouses; (b) the building code requirements, including all life-safety chapters, that provide additional determining criteria, such as construction types, fire-resistance, fire protection systems and egress; and (c) the NFPA 101 as adopted by *Florida Fire Prevention Code*, egress and protection determining criteria. The more restrictive criteria are then applied.

SECTION 904 ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS

[F] 904.1 General. Automatic fire-extinguishing systems, other than automatic sprinkler systems, shall be designed, installed, inspected, tested and maintained in accordance with the provisions of this section and the applicable referenced standards.

[F] 904.2 Where required. Automatic fire-extinguishing systems installed as an alternative to the required automatic sprinkler systems of Section 903 shall be approved by the fire code official. Automatic fire-extinguishing systems shall not be considered alternatives for the purposes of exceptions or reductions allowed by other requirements of this code.

[F] 904.2.1 Commercial hood and duct systems. Each required commercial kitchen exhaust hood and duct system required by the *Florida Fire Prevention Code* or Chapter 5 of the *Florida Building Code, Mechanical* to have a Type I hood shall be protected with an approved automatic fire-extinguishing system installed in accordance with this code.

[F] 904.3 Installation. Automatic fire-extinguishing systems shall be installed in accordance with this section.

[F] 904.3.1 Electrical wiring. Electrical wiring shall be in accordance with the Chapter 27 of this code.

[F] 904.3.2 Actuation. Automatic fire-extinguishing systems shall be automatically actuated and provided with a manual means of actuation in accordance with Section 904.11.1.

[F] 904.3.3 System interlocking. Automatic equipment interlocks with fuel shutoffs, ventilation controls, door closers, window shutters, conveyor openings, smoke and heat vents and other features necessary for proper operation of the fire-extinguishing system shall be provided as required by the design and installation standard utilized for the hazard.

[F] 904.3.4 Alarms and warning signs. Where alarms are required to indicate the operation of automatic fire-extinguishing systems, distinctive audible and visible alarms and warning signs shall be provided to warn of pending agent discharge. Where exposure to automatic-extinguishing agents poses a hazard to persons and a delay is required to ensure the evacuation of occupants before agent discharge, a separate warning signal shall be provided to alert occupants once agent discharge has begun. Audible signals shall be in accordance with Section 907.9.2.

[F] 904.3.5 Monitoring. Where a building fire alarm system is installed, automatic fire-extinguishing systems shall be monitored by the building fire alarm system in accordance with NFPA 72.

[F] 904.4 Inspection and testing. Automatic fire-extinguishing systems shall be inspected and tested in accordance with the provisions of this section prior to acceptance.

[F] 904.4.1 Inspection. Prior to conducting final acceptance tests, the following items shall be inspected:

1. Hazard specification for consistency with design hazard.
2. Type, location and spacing of automatic- and manual-initiating devices.
3. Size, placement and position of nozzles or discharge orifices.
4. Location and identification of audible and visible alarm devices.
5. Identification of devices with proper designations.
6. Operating instructions.

[F] 904.4.2 Alarm testing. Notification appliances, connections to fire alarm systems and connections to approved supervising stations shall be tested in accordance with this section and Section 907 to verify proper operation.

[F] 904.4.2.1 Audible and visible signals. The audibility and visibility of notification appliances signaling agent discharge or system operation, where required, shall be verified.

[F] 904.4.3 Monitor testing. Connections to protected premises and supervising station fire alarm systems shall be tested to verify proper identification and retransmission of alarms from automatic fire-extinguishing systems.

[F] 904.5 Wet-chemical systems. Wet-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 17A and their listing.

[F] 904.6 Dry-chemical systems. Dry-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 17 and their listing.

[F] 904.7 Foam systems. Foam-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 11 and NFPA 16 and their listing.

[F] 904.8 Carbon dioxide systems. Carbon dioxide extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 12 and their listing.

[F] 904.9 Halon systems. Halogenated extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 12A and their listing.

[F] 904.10 Clean-agent systems. Clean-agent fire-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 2001 and their listing.

[F] 904.11 Commercial cooking systems. The automatic fire-extinguishing system for commercial cooking systems shall be of a type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Preengineered automatic dry- and wet-chemical extinguishing systems shall be tested in accordance with UL 300 and listed and labeled for the intended application. Other types of automatic fire-extinguishing systems shall be listed and labeled for specific use as protection for commercial cooking operations. The system shall be installed in accordance with this code, its listing and the manufacturer's installation instructions. Automatic fire-extinguishing systems

of the following types shall be installed in accordance with the referenced standard indicated, as follows:

1. Carbon dioxide extinguishing systems, NFPA 12.
2. Automatic sprinkler systems, NFPA 13.
3. Foam-water sprinkler system or foam-water spray systems, NFPA 16.
4. Dry-chemical extinguishing systems, NFPA 17.
5. Wet-chemical extinguishing systems, NFPA 17A.

Exception: Factory-built commercial cooking recirculating systems that are tested in accordance with UL 710B and listed, labeled and installed in accordance with Section 304.1 of the *Florida Building Code, Mechanical*.

[F] 904.11.1 Manual system operation. A manual actuation device shall be located at or near a means of egress from the cooking area a minimum of 10 feet (3048 mm) and a maximum of 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) or less than 42 inches (1067 mm) above the floor and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

Exception: Automatic sprinkler systems shall not be required to be equipped with manual actuation means.

[F] 904.11.2 System interconnection. The actuation of the fire suppression system shall automatically shut down the fuel or electrical power supply to the cooking equipment. The fuel and electrical supply reset shall be manual.

[F] 904.11.3 Carbon dioxide systems. When carbon dioxide systems are used, there shall be a nozzle at the top of the ventilating duct. Additional nozzles that are symmetrically arranged to give uniform distribution shall be installed within vertical ducts exceeding 20 feet (6096 mm) and horizontal ducts exceeding 50 feet (15 240 mm). Dampers shall be installed at either the top or the bottom of the duct and shall be arranged to operate automatically upon activation of the fire-extinguishing system. Where the damper is installed at the top of the duct, the top nozzle shall be immediately below the damper. Automatic carbon dioxide fire-extinguishing systems shall be sufficiently sized to protect against all hazards venting through a common duct simultaneously.

[F] 904.11.3.1 Ventilation system. Commercial-type cooking equipment protected by an automatic carbon dioxide-extinguishing system shall be arranged to shut off the ventilation system upon activation.

[F] 904.11.4 Special provisions for automatic sprinkler systems. Automatic sprinkler systems protecting commercial-type cooking equipment shall be supplied from a separate, readily accessible, indicating-type control valve that is identified.

[F] 904.11.4.1 Listed sprinklers. Sprinklers used for the protection of fryers shall be tested in accordance with UL 199E, listed for that application and installed in accordance with their listing.

SECTION 905 STANDPIPE SYSTEMS

905.1 General. Standpipe systems shall be provided in all new buildings in which:

1. The highest floor is more than 30 feet (9144 mm) above the lowest level of fire department vehicle access; or
2. The highest floor is more than three stories above grade; or
3. The lowest floor is more than one story below grade; or
4. The lowest floor is more than 20 feet (6.1 m) below grade.

Fire hose threads used in connection with standpipe systems shall be approved and shall be compatible with fire department hose threads. The location of fire department hose connections shall be approved. In buildings used for high-piled combustible storage, fire protection shall be in accordance with the *Florida Fire Prevention Code*.

[F] 905.2 Installation standard. Standpipe systems shall be installed in accordance with this section and NFPA 14.

[F] 905.3 Required installations. Standpipe systems shall be installed where required by Sections 905.1 and 905.3.1 through 905.3.7 and in the locations indicated in Sections 905.4, 905.5 and 905.6. Standpipe systems are allowed to be combined with automatic sprinkler systems.

Exception: Standpipe systems are not required in Group R-3 occupancies.

[F] 905.3.1 Building height. Class III standpipe systems shall be installed throughout buildings where the floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of fire department vehicle access, or where the floor level of the lowest story is located more than 30 feet (9144 mm) below the highest level of fire department vehicle access. High-rise buildings shall be protected throughout by a Class I standpipe system.

Exceptions:

1. Class I standpipes are allowed in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Class I manual standpipes are allowed in open parking garages where the highest floor is located not more than 150 feet (45 720 mm) above the lowest level of fire department vehicle access.
3. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.
4. Class I standpipes are allowed in basements equipped throughout with an automatic sprinkler system.
5. In determining the lowest level of fire department vehicle access, it shall not be required to consider:

- 5.1. Recessed loading docks for four vehicles or less; and
 - 5.2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.
6. In buildings less than 75 feet (22 860 mm) in height which are protected throughout with an approved and maintained fire sprinkler system, a manual wet standpipe, as defined in NFPA 14, Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems, shall be allowed.

[F] 905.3.2 Group A. Class I automatic wet standpipes shall be provided in nonsprinklered Group A buildings having an occupant load exceeding 1,000 persons.

Exceptions:

1. Open-air-seating spaces without enclosed spaces.
2. Class I automatic dry and semiautomatic dry standpipes or manual wet standpipes are allowed in buildings where the highest floor surface used for human occupancy is 75 feet (22 860 mm) or less above the lowest level of fire department vehicle access.

[F] 905.3.3 Covered mall buildings. A covered mall building shall be equipped throughout with a standpipe system where required by Section 905.3.1. Covered mall buildings not required to be equipped with a standpipe system by Section 905.3.1 shall be equipped with Class I hose connections connected to a system sized to deliver water at 250 gallons per minute (946.4 L/min) at the most hydraulically remote outlet. Hose connections shall be provided at each of the following locations:

1. Within the mall at the entrance to each exit passageway or corridor.
2. At each floor-level landing within enclosed stairways opening directly on the mall.
3. At exterior public entrances to the mall.

[F] 905.3.4 Stages. Stages greater than 1,000 square feet in area (93 m²) shall be equipped with a Class III wet standpipe system with 1½-inch and 2½-inch (38 mm and 64 mm) hose connections on each side of the stage.

Exception: Where the building or area is equipped throughout with an automatic sprinkler system, a 1½-inch (38 mm) hose connection shall be installed in accordance with NFPA 13 or in accordance with NFPA 14 for Class II or III standpipes.

[F] 905.3.4.1 Hose and cabinet. The 1½-inch (38 mm) hose connections shall be equipped with sufficient lengths of 1½-inch (38 mm) hose to provide fire protection for the stage area. Hose connections shall be equipped with an approved adjustable fog nozzle and be mounted in a cabinet or on a rack.

[F] 905.3.5 Underground buildings. Underground buildings shall be equipped throughout with a Class I automatic wet or manual wet standpipe system.

[F] 905.3.6 Helistops and heliports. Buildings with a helistop or heliport that are equipped with a standpipe shall extend the standpipe to the roof level on which the helistop or heliport is located in accordance with the *Florida Fire Prevention Code*.

[F] 905.3.7 Marinas and boatyards. Marinas and boatyards shall be equipped throughout with standpipe systems in accordance with NFPA 303.

[F] 905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required stairway, a hose connection shall be provided for each floor level above or below grade. Hose connections shall be located at an intermediate floor level landing between floors, unless otherwise approved by the fire code official.
2. On each side of the wall adjacent to the exit opening of a horizontal exit.

Exception: Where floor areas adjacent to a horizontal exit are reachable from exit stairway hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30480 mm) of hose, a hose connection shall not be required at the horizontal exit.
3. In every exit passageway at the entrance from the exit passageway to other areas of a building.
4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit passageway or exit corridor to the mall.
5. Where the roof has a slope less than four units vertical in 12 units horizontal (33.3-percent slope), each standpipe shall be provided with a hose connection located either on the roof or at the highest landing of stairways with stair access to the roof. An additional hose connection shall be provided at the top of the most hydraulically remote standpipe for testing purposes.

6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the fire code official is authorized to require that additional hose connections be provided in approved locations.

[F] 905.4.1 Protection. Risers and laterals of Class I standpipe systems not located within an enclosed stairway or pressurized enclosure shall be protected by a degree of fire resistance equal to that required for vertical enclosures in the building in which they are located.

Exception: In buildings equipped throughout with an approved automatic sprinkler system, laterals that are not located within an enclosed stairway or pressurized enclosure are not required to be enclosed within fire-resistance-rated construction.

[F] 905.4.2 Interconnection. In buildings where more than one standpipe is provided, the standpipes shall be interconnected in accordance with NFPA 14.

[F] 905.5 Location of Class II standpipe hose connections. Class II standpipe hose connections shall be accessible and located so that all portions of the building are within 30 feet (9144 mm) of a nozzle attached to 100 feet (30 480 mm) of hose.

[F] 905.5.1 Groups A-1 and A-2. In Group A-1 and A-2 occupancies with occupant loads of more than 1,000, hose connections shall be located on each side of any stage, on each side of the rear of the auditorium, on each side of the balcony and on each tier of dressing rooms.

[F] 905.5.2 Protection. Fire-resistance-rated protection of risers and laterals of Class II standpipe systems is not required.

[F] 905.5.3 Class II system 1-inch hose. A minimum 1-inch (25 mm) hose shall be permitted to be used for hose stations in light-hazard occupancies where investigated and listed for this service and where approved by the fire code official.

[F] 905.6 Location of Class III standpipe hose connections. Class III standpipe systems shall have hose connections located as required for Class I standpipes in Section 905.4 and shall have Class II hose connections as required in Section 905.5.

[F] 905.6.1 Protection. Risers and laterals of Class III standpipe systems shall be protected as required for Class I systems in accordance with Section 905.4.1.

[F] 905.6.2 Interconnection. In buildings where more than one Class III standpipe is provided, the standpipes shall be interconnected at the bottom.

[F] 905.7 Cabinets. Cabinets containing fire-fighting equipment such as standpipes, fire hoses, fire extinguishers or fire department valves shall not be blocked from use or obscured from view.

[F] 905.7.1 Cabinet equipment identification. Cabinets shall be identified in an approved manner by a permanently attached sign with letters not less than 2 inches (51 mm) high in a color that contrasts with the background color, indicating the equipment contained therein.

Exceptions:

1. Doors not large enough to accommodate a written sign shall be marked with a permanently attached pictogram of the equipment contained therein.
2. Doors that have either an approved visual identification clear glass panel or a complete glass door panel are not required to be marked.

[F] 905.7.2 Locking cabinet doors. Cabinets shall be unlocked.

Exceptions:

1. Visual identification panels of glass or other approved transparent frangible material that is easily broken and allows access.
2. Approved locking arrangements.
3. Group I-3.

[F] 905.8 Dry standpipes. Dry standpipes shall not be installed.

Exception: Where subject to freezing and in accordance with NFPA 14.

[F] 905.9 Valve supervision. Valves controlling water supplies shall be supervised in the open position so that a change in the normal position of the valve will generate a supervisory signal at the supervising station required by Section 903.4. Where a fire alarm system is provided, a signal shall also be transmitted to the control unit.

Exceptions:

1. Valves to underground key or hub valves in roadway boxes provided by the municipality or public utility do not require supervision.
2. Valves locked in the normal position and inspected as provided in this code in buildings not equipped with a fire alarm system.

[F] 905.10 During construction. Standpipe systems required during construction and demolition operations shall be provided in accordance with Section 3311.

SECTION 906 PORTABLE FIRE EXTINGUISHERS

[F] 906.1 General. Portable fire extinguishers shall be provided in occupancies and locations as required by the *Florida Fire Prevention Code*.

SECTION 907 FIRE ALARM AND DETECTION SYSTEMS

[F] 907.1 General. This section covers the application, installation, performance and maintenance of fire alarm systems and their components.

[F] 907.1.1 Construction documents. Construction documents for fire alarm systems shall be submitted for review and approval prior to system installation. Construction documents shall include, but not be limited to, all of the following:

1. A floor plan which indicates the use of all rooms.
2. Locations of alarm-initiating and notification appliances.
3. Alarm control and trouble signaling equipment.
4. Annunciation.
5. Power connection.
6. Battery calculations.
7. Conductor type and sizes.
8. Voltage drop calculations.
9. Manufacturers, model numbers and listing information for equipment, devices and materials.
10. Details of ceiling height and construction.
11. The interface of fire safety control functions.

[F] 907.1.2 Equipment. Systems and their components shall be listed and approved for the purpose for which they are installed.

907.1.3 Accessibility. Every required fire alarm system shall include a visible alarm-indicating appliance in public and common areas. For more specific accessibility requirements related to alarm-indicating appliances, refer to Section 11-4.28.

[F]907.2 Where required. An approved manual, automatic or manual and automatic fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.23 and provide occupant notification in accordance with Section 907.9, unless other requirements are provided by another section of this code. Where automatic sprinkler protection installed in accordance with Section 903.3.1.1 or 903.3.1.2 is provided and connected to the building fire alarm system, automatic heat detection required by this section shall not be required.

The automatic fire detectors shall be smoke detectors. Where ambient conditions prohibit installation of automatic smoke detection, other automatic fire detection shall be allowed.

[F]907.2.1 Group A. A manual fire alarm system shall be installed in Group A occupancies having an occupant load of 300 or more. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system and the alarm notification appliances will activate upon sprinkler water flow.

[F] 907.2.1.1 System initiation in Group A occupancies with an occupant load of 1,000 or more. Activation of the fire alarm in Group A occupancies with an occupant load of 1,000 or more shall initiate a signal using an emergency voice/alarm communications system in accordance with NFPA 72.

Exception: Where approved, the prerecorded announcement is allowed to be manually deactivated for a period of time, not to exceed 3 minutes, for the sole purpose of allowing a live voice announcement from an approved, constantly attended location.

[F] 907.2.1.2 Emergency power. Emergency voice/alarm communications systems shall be provided with an approved emergency power source.

907.2.2 Group B. A fire alarm system in accordance with Section 907 shall be provided in all business occupancies where any one of the following conditions exists:

1. The building is two or more stories in height above the level of exit discharge.
2. The occupancy is subject to 50 or more occupants above or below the level of exit discharge.
3. The occupancy is subject to 300 or more total occupants.

[F] 907.2.3 Group E. A manual fire alarm system shall be installed in Group E occupancies. When automatic sprinkler systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

Exceptions:

1. Group E occupancies with an occupant load of less than 50.
2. Manual fire alarm boxes are not required in Group E occupancies where all the following apply:
 - 2.1. Interior corridors are protected by smoke detectors with alarm verification.
 - 2.2. Auditoriums, cafeterias, gymnasiums and the like are protected by heat detectors or other approved detection devices.
 - 2.3. Shops and laboratories involving dusts or vapors are protected by heat detectors or other approved detection devices.
 - 2.4. Off-premises monitoring is provided.
 - 2.5. The capability to activate the evacuation signal from a central point is provided.
 - 2.6. In buildings where normally occupied spaces are provided with a two-way communication system between such spaces and a constantly attended receiving station from where a general evacuation alarm can be sounded, except in locations specifically designated by the fire code official.
3. Manual fire alarm boxes shall not be required in Group E occupancies where the building is equipped throughout with an approved automatic sprinkler system, the notification appliances will activate on sprinkler water flow and manual activation is provided from a normally occupied location.

907.2.4 Group F. A fire alarm system shall be required in accordance with Section 907 for industrial occupancies, unless the total capacity of the building is under 100 persons and of these fewer than 25 persons are above or below the level of exit discharge.

[F] 907.2.5 Group H. A manual fire alarm system shall be installed in Group H-5 occupancies and in occupancies used for the manufacture of organic coatings. An automatic smoke detection system shall be installed for highly toxic gases, organic peroxides and oxidizers in accordance with the *Florida Fire Prevention Code*.

[F] 907.2.6 Group I. A manual fire alarm system shall be installed in Group I occupancies. An electrically supervised, automatic smoke detection system shall be provided in accordance with Sections 907.2.6.1 and 907.2.6.2.

Exception: Manual fire alarm boxes in resident or patient sleeping areas of Group I-1 and I-2 occupancies shall not be required at exits if located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously

accessible and that travel distances required in Section 907.3.1 are not exceeded.

[F] 907.2.6.1 Group I-1. Corridors, habitable spaces other than sleeping units and kitchens and waiting areas that are open to corridors shall be equipped with an automatic smoke detection system.

Exceptions:

1. Smoke detection in habitable spaces is not required where the facility is equipped throughout with an automatic sprinkler system.
2. Smoke detection is not required for exterior balconies.

[F] 907.2.6.2 Group I-2. Corridors in nursing homes (both intermediate care and skilled nursing facilities), detoxification facilities and spaces permitted to be open to the corridors by Section 407.2 shall be equipped with an automatic fire detection system. Hospitals shall be equipped with smoke detection as required in Section 407.2.

Exceptions:

1. Corridor smoke detection is not required in smoke compartments that contain patient sleeping units where patient sleeping units are provided with smoke detectors that comply with UL 268. Such detectors shall provide a visual display on the corridor side of each patient sleeping unit and an audible and visual alarm at the nursing station attending each unit.
2. Corridor smoke detection is not required in smoke compartments that contain patient sleeping units where patient sleeping unit doors are equipped with automatic door-closing devices with integral smoke detectors on the unit sides installed in accordance with their listing, provided that the integral detectors perform the required alerting function.

[F] 907.2.6.3 Group I-3. Group I-3 occupancies shall be equipped with a manual and automatic fire alarm system installed for alerting staff.

[F] 907.2.6.3.1 System initiation. Actuation of an automatic fire-extinguishing system, a manual fire alarm box or a fire detector shall initiate an approved fire alarm signal which automatically notifies staff. Presignal systems shall not be used.

[F] 907.2.6.3.2 Manual fire alarm boxes. Manual fire alarm boxes are not required to be located in accordance with Section 907.3 where the fire alarm boxes are provided at staff-attended locations having direct supervision over areas where manual fire alarm boxes have been omitted.

Manual fire alarm boxes shall be permitted to be locked in areas occupied by detainees, provided that staff members are present within the subject area and have keys readily available to operate the manual fire alarm boxes.

[F] 907.2.6.3.3 Smoke detectors. An approved automatic smoke detection system shall be installed

throughout resident housing areas, including sleeping units and contiguous day rooms, group activity spaces and other common spaces normally accessible to residents.

Exceptions:

1. Other approved smoke detection arrangements providing equivalent protection including, but not limited to, placing detectors in exhaust ducts from cells or behind protective guards listed for the purpose are allowed when necessary to prevent damage or tampering.
2. Sleeping units in Use Conditions 2 and 3.
3. Smoke detectors are not required in sleeping units with four or fewer occupants in smoke compartments that are equipped throughout with an approved automatic sprinkler system.

[F] 907.2.7 Group M. A manual fire alarm system shall be installed in Group M occupancies having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge. The initiation of a signal from a manual fire alarm box shall initiate alarm notification appliances as required by Section 907.9.

Exceptions:

1. A manual fire alarm system is not required in covered mall buildings complying with Section 402.
2. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system and the alarm notification appliances will automatically activate upon sprinkler water flow.

[F] 907.2.7.1 Occupant notification. During times that the building is occupied, the initiation of a signal from a manual fire alarm box or from a water flow switch shall not be required to activate the alarm notification appliances when an alarm signal is activated at a constantly attended location from which evacuation instructions shall be initiated over an emergency voice/alarm communication system installed in accordance with Section 907.2.12.2.

The emergency voice/alarm communication system shall be allowed to be used for other announcements provided the manual fire alarm use takes precedence over any other use.

[F] 907.2.8 Group R-1. Fire alarm systems shall be installed in Group R-1 occupancies as required in Sections 907.2.8.1 through 907.2.8.3.

[F] 907.2.8.1 Manual fire alarm system. A manual fire alarm system shall be installed in Group R-1 occupancies.

Exceptions:

1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual sleeping units and contigu-

ous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each individual sleeping unit has an exit directly to a public way, exit court or yard.

2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:

- 2.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2;
- 2.2. The notification appliances will activate upon sprinkler water flow; and
- 2.3. At least one manual fire alarm box is installed at an approved location.

[F] 907.2.8.2 Automatic fire alarm system. An automatic fire alarm system shall be installed throughout all interior corridors serving sleeping units.

Exception: An automatic fire detection system is not required in buildings that do not have interior corridors serving sleeping units and where each sleeping unit has a means of egress door opening directly to an exterior exit access that leads directly to an exit.

[F] 907.2.8.3 Smoke alarms. Smoke alarms shall be installed as required by Section 907.2.10. In buildings that are not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the smoke alarms in sleeping units shall be connected to an emergency electrical system and shall be annunciated by sleeping unit at a constantly attended location from which the fire alarm system is capable of being manually activated.

[F] 907.2.9 Group R-2. A manual fire alarm system shall be installed in Group R-2 occupancies where:

1. Any dwelling unit or sleeping unit is located three or more stories above the lowest level of exit discharge;
2. Any dwelling unit or sleeping unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit; or
3. The building contains more than 11 dwelling units or sleeping units.

Exceptions:

1. A fire alarm system is not required in buildings not more than two stories in height where all dwelling units or sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, exit court or yard.
2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:

2.1. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or Section 903.3.1.2; and

2.2. The notification appliances will activate upon sprinkler flow.

3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1023.6, Exception 4.

[F] 907.2.10 Single- and multiple-station smoke alarms. Listed single- and multiple-station smoke alarms complying with UL 217 shall be installed in accordance with the provisions of this code and the household fire-warning equipment provisions of NFPA 72.

[F] 907.2.10.1 Where required. Single- or multiple-station smoke alarms shall be installed in the locations described in Sections 907.2.10.1.1 through 907.2.10.1.3.

907.2.10.1.1 Group R-1. An approved single-station smoke alarm shall be installed in every guestroom and every living area and sleeping room within a guest suite.

[F] 907.2.10.1.2 Groups R-2, R-3, R-4 and I-1. Single- or multiple-station smoke alarms shall be installed and maintained in Groups R-2, R-3, R-4 and I-1, regardless of occupant load at all of the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
2. In each room used for sleeping purposes.
3. In each story within a dwelling unit, including basements but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

[F] 907.2.10.1.3 Group I-1. Single- or multiple-station smoke alarms shall be installed and maintained in sleeping areas in Group I-1 occupancies.

Exception: Single- or multiple-station smoke alarms shall not be required where the building is equipped throughout with an automatic fire detection system in accordance with Section 907.2.6.

[F] 907.2.10.2 Power source. In new construction, required smoke alarms shall receive their primary power from the building wiring where such wiring is served

from a commercial source and shall be equipped with a battery backup. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exception: Smoke alarms are not required to be equipped with battery backup in Group R-1 where they are connected to an emergency electrical system.

[F] 907.2.10.3 Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit in Group R-2, R-3 or R-4, or within an individual dwelling unit or sleeping unit in Group R-1, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

[F] 907.2.10.4 Acceptance testing. When the installation of the alarm devices is complete, each detector and interconnecting wiring for multiple-station alarm devices shall be tested in accordance with the household fire warning equipment provisions of NFPA 72.

[F] 907.2.11 Special amusement buildings. An approved automatic smoke detection system shall be provided in special amusement buildings in accordance with this section.

Exception: In areas where ambient conditions will cause a smoke detection system to alarm, an approved alternative type of automatic detector shall be installed.

[F] 907.2.11.1 Alarm. Activation of any single smoke detector, the automatic sprinkler system or any other automatic fire detection device shall immediately sound an alarm at the building at a constantly attended location from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 907.2.11.2.

[F] 907.2.11.2 System response. The activation of two or more smoke detectors, a single smoke detector with alarm verification, the automatic sprinkler system or other approved fire detection device shall automatically:

1. Cause illumination of the means of egress with light of not less than 1 foot-candle (11 lux) at the walking surface level;
2. Stop any conflicting or confusing sounds and visual distractions; and
3. Activate an approved directional exit marking that will become apparent in an emergency.

Such system response shall also include activation of a prerecorded message, clearly audible throughout the special amusement building, instructing patrons to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound which is distinctive from other sounds used during normal operation.

The wiring to the auxiliary devices and equipment used to accomplish the above fire safety

functions shall be monitored for integrity in accordance with NFPA 72.

[F] 907.2.11.3 Emergency voice/alarm communication system. An emergency voice/alarm communication system, which is also allowed to serve as a public address system, shall be installed in accordance with NFPA 72, and shall be audible throughout the entire special amusement building.

[F] 907.2.12 High-rise buildings. Buildings with a floor used for human occupancy located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access shall be provided with an automatic fire alarm system and an emergency voice/alarm communication system in accordance with Section 907.2.12.2.

Exceptions:

1. Airport traffic control towers in accordance with Sections 412 and 907.2.22.
2. Open parking garages in accordance with Section 406.3.
3. Buildings with an occupancy in Group A-5.
4. Low-hazard special occupancies in accordance with Section 503.1.1.
5. Buildings with an occupancy in Group H-1, H-2 or H-3 in accordance with Section 415.

[F] 907.2.12.1 Automatic fire detection. Smoke detectors shall be provided in accordance with this section. Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall operate the emergency voice/alarm communication system. Smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment or similar room which is not provided with sprinkler protection, elevator machine rooms and in elevator lobbies.
2. In the main return air and exhaust air plenum of each air-conditioning system having a capacity greater than 2,000 cubic feet per minute (cfm) (0.94 m³/s). Such detectors shall be located in a serviceable area downstream of the last duct inlet.
3. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum of an air-conditioning system. In Group R-1 and R-2 occupancies a listed smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm (2.4 m³/s) and serving not more than 10 air inlet openings.

[F] 907.2.12.2 Emergency voice/alarm communication system. The operation of any automatic fire detector, sprinkler water-flow device or manual fire alarm box shall automatically sound an alert tone followed by voice instructions giving approved information and directions for a general or staged evacuation on a minimum of the alarming floor, the floor above and the floor below in accordance with the building's fire safety and evacuation

plans required by the *Florida Fire Prevention Code*. Speakers shall be provided throughout the building by paging zones. As a minimum, paging zones shall be provided as follows:

1. Elevator groups.
2. Exit stairways.
3. Each floor.
4. Areas of refuge as defined in Section 1002.1.

Exception: In Group I-1 and I-2 occupancies, the alarm shall sound in a constantly attended area and a general occupant notification shall be broadcast over the overhead page.

[F] 907.2.12.2.1 Manual override. A manual override for emergency voice communication shall be provided on a selective and all-call basis for all paging zones.

[F] 907.2.12.2.2 Live voice messages. The emergency voice/alarm communication system shall also have the capability to broadcast live voice messages through paging zones on a selective and all-call basis.

[F] 907.2.12.2.3 Standard. The emergency voice/alarm communication system shall be designed and installed in accordance with NFPA 72.

[F] 907.2.12.3 Fire department communication system. An approved two-way, fire department communication system designed and installed in accordance with NFPA 72 shall be provided for fire department use. It shall operate between a fire command center complying with Section 911 and elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside enclosed exit stairways. The fire department communication device shall be provided at each floor level within the enclosed stairway.

Exception: Fire department radio systems where approved by the fire department.

[F] 907.2.13 Atriums connecting more than two stories. A fire alarm system shall be installed in occupancies with an atrium that connects more than two stories. The system shall be activated in accordance with Section 907.6. Such occupancies in Group A, E or M shall be provided with an emergency voice/alarm communication system complying with the requirements of Section 907.2.12.2.

[F] 907.2.14 High-piled combustible storage areas. An automatic fire detection system shall be installed throughout high-piled combustible storage areas where required by the *Florida Fire Prevention Code*.

[F] 907.2.15 Delayed egress locks. Where delayed egress locks are installed on means of egress doors in accordance with Section 1008.1.8.6, an automatic smoke or heat detection system shall be installed as required by that section.

907.2.16 Aerosol storage uses. Aerosol storage rooms and general-purpose warehouses containing aerosols shall be provided with an approved manual fire alarm system where required by the *Florida Fire Prevention Code*.

[F] 907.2.17 Lumber, wood structural panel and veneer mills. Lumber, wood structural panel and veneer mills shall be provided with a manual fire alarm system.

[F] 907.2.18 Underground buildings with smoke exhaust system. Where a smoke exhaust system is installed in an underground building in accordance with this code, automatic fire detectors shall be provided in accordance with this section.

[F] 907.2.18.1 Smoke detectors. A minimum of one smoke detector listed for the intended purpose shall be installed in the following areas:

1. Mechanical equipment, electrical, transformer, telephone equipment, elevator machine or similar rooms.
2. Elevator lobbies.
3. The main return and exhaust air plenum of each air-conditioning system serving more than one story and located in a serviceable area downstream of the last duct inlet.
4. Each connection to a vertical duct or riser serving two or more floors from return air ducts or plenums of heating, ventilating and air-conditioning systems, except that in Group R occupancies, a listed smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm (2.4 m³/s) and serving not more than 10 air inlet openings.

[F] 907.2.18.2 Alarm required. Activation of the smoke exhaust system shall activate an audible alarm at a constantly attended location.

[F] 907.2.19 Underground buildings. Where the lowest level of a structure is more than 60 feet (18 288 mm) below the lowest level of exit discharge, the structure shall be equipped throughout with a manual fire alarm system, including an emergency voice/alarm communication system installed in accordance with Section 907.2.12.2.

[F] 907.2.19.1 Public address system. Where a fire alarm system is not required by Section 907.2, a public address system shall be provided that shall be capable of transmitting voice communications to the highest level of exit discharge serving the underground portions of the structure and all levels below.

[F] 907.2.20 Covered mall buildings. Covered mall buildings exceeding 50,000 square feet (4645 m²) in total floor area shall be provided with an emergency voice/alarm communication system. An emergency voice/alarm communication system serving a mall, required or otherwise, shall be accessible to the fire department. The system shall be provided in accordance with Section 907.2.12.2.

[F] 907.2.21 Residential aircraft hangars. A minimum of one listed smoke alarm shall be installed within a residential aircraft hangar as defined in Section 412.3.1 and shall be interconnected into the residential smoke alarm or other sounding device to provide an alarm that will be audible in all sleeping areas of the dwelling.

[F] 907.2.22 Airport traffic control towers. An automatic fire detection system shall be provided in airport traffic control towers.

[F] 907.2.23 Battery rooms. An approved automatic smoke detection system shall be installed in areas containing stationary storage battery systems having a liquid capacity of more than 50 gallons (189.3 L). The detection system shall be supervised by an approved central, proprietary or remote station service or a local alarm that will sound an audible signal at a constantly attended location.

[F] 907.3 Manual fire alarm boxes. Manual fire alarm boxes shall be installed in accordance with Sections 907.3.1 through 907.3.5.

[F] 907.3.1 Location. Manual fire alarm boxes shall be located not more than 5 feet (1524 mm) from the entrance to each exit. Additional manual fire alarm boxes shall be located so that travel distance to the nearest box does not exceed 200 feet (60 960 mm).

[F] 907.3.2 Height. The height of the manual fire alarm boxes shall be a minimum of 42 inches (1067 mm) and a maximum of 48 inches (1219 mm), measured vertically, from the floor level to the activating handle or lever of the box.

[F] 907.3.3 Color. Manual fire alarm boxes shall be red in color.

[F] 907.3.4 Signs. Where fire alarm systems are not monitored by a supervising station, an approved permanent sign shall be installed adjacent to each manual fire alarm box that reads: WHEN ALARM SOUNDS—CALL FIRE DEPARTMENT.

Exception: Where the manufacturer has permanently provided this information on the manual fire alarm box.

[F] 907.3.5 Protective covers. The fire code official is authorized to require the installation of listed manual fire alarm box protective covers to prevent malicious false alarms or to provide the manual fire alarm box with protection from physical damage. The protective cover shall be transparent or red in color with a transparent face to permit visibility of the manual fire alarm box. Each cover shall include proper operating instructions. A protective cover that emits a local alarm signal shall not be installed unless approved.

[F] 907.4 Power supply. The primary and secondary power supplies for the fire alarm system shall be provided in accordance with NFPA 72.

907.5 Wiring. Wiring shall comply with the requirements of Chapter 27. Wireless protection systems utilizing radio-frequency transmitting devices shall comply with the special requirements for supervision of low-power wireless systems in NFPA 72.

[F] 907.6 Activation. Where an alarm notification system is required by another section of this code, it shall be activated by:

1. A required automatic fire alarm system.
2. Sprinkler water-flow devices.
3. Required manual fire alarm boxes.

[F] 907.7 Presignal system. Presignal systems shall not be installed unless approved by the fire code official and the fire department. Where a presignal system is installed, 24-hour personnel supervision shall be provided at a location approved by the fire department, in order that the alarm signal can be actuated in the event of fire or other emergency.

[F] 907.8 Zones. Each floor shall be zoned separately and a zone shall not exceed 22,500 square feet (2090 m²). The length of any zone shall not exceed 300 feet (91 440 mm) in any direction.

Exception: Automatic sprinkler system zones shall not exceed the area permitted by NFPA 13.

[F] 907.8.1 Zoning indicator panel. A zoning indicator panel and the associated controls shall be provided in an approved location. The visual zone indication shall lock in until the system is reset and shall not be canceled by the operation of an audible alarm-silencing switch.

[F] 907.8.2 High-rise buildings. In buildings with a floor used for human occupancy that is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, a separate zone by floor shall be provided for all of the following types of alarm-initiating devices where provided:

1. Smoke detectors.
2. Sprinkler water-flow devices.
3. Manual fire alarm boxes.
4. Other approved types of automatic fire detection devices or suppression systems.

[F] 907.9 Alarm notification appliances. Alarm notification appliances shall be provided and shall be listed for their purpose.

[F] 907.9.1 Visible alarms. Visible alarm notification appliances shall be provided in accordance with Sections 907.9.1.1 through 907.9.1.4.

Exceptions:

1. Visible alarm notification appliances are not required in alterations, except where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.
2. Visible alarm notification appliances shall not be required in exits as defined in Section 1002.1.

[F] 907.9.1.1 Public and common areas. Visible alarm notification appliances shall be provided in public areas and common areas.

[F] 907.9.1.2 Employee work areas. Where employee work areas have audible alarm coverage, the notification appliance circuits serving the employee work areas shall be initially designed with a minimum of 20 percent spare capacity to account for the potential of adding visible notification appliances in the future to accommodate hearing impaired employees.

[F] 907.9.1.3 Groups I-1 and R-1. Group I-1 and R-1 sleeping units in accordance with Table 907.9.1.3 shall be provided with a visible alarm notification appliance,

activated by both the in-room smoke alarm and the building fire alarm system.

**[F] TABLE 907.9.1.3
VISIBLE AND AUDIBLE ALARMS**

NUMBER OF SLEEPING UNITS	SLEEPING UNITS WITH VISIBLE AND AUDIBLE ALARMS
6 to 25	2
26 to 50	4
51 to 75	7
76 to 100	9
101 to 150	12
151 to 200	14
201 to 300	17
301 to 400	20
401 to 500	22
501 to 1,000	5% of total
1,001 and over	50 plus 3 for each 100 over 1,000

[F] 907.9.1.4 Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, all dwelling units and sleeping units shall be provided with the capability to support visible alarm notification appliances in accordance with ICC A117.1.

[F] 907.9.2 Audible alarms. Audible alarm notification appliances shall be provided and shall sound a distinctive sound that is not to be used for any purpose other than that of a fire alarm. The audible alarm notification appliances shall provide a sound pressure level of 15 decibels (dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, in every occupied space within the building. The minimum sound pressure levels shall be: 70 dBA in occupancies in Groups R and I-1; 90 dBA in mechanical equipment rooms and 60 dBA in other occupancies. The maximum sound pressure level for audible alarm notification appliances shall be 120 dBA at the minimum hearing distance from the audible appliance. Where the average ambient noise is greater than 105 dBA, visible alarm notification appliances shall be provided in accordance with NFPA 72 and audible alarm notification appliances shall not be required.

Exception: Visible alarm notification appliances shall be allowed in lieu of audible alarm notification appliances in critical-care areas of Group I-2 occupancies.

907.9.3 Accessibility. Alarm systems required to be accessible by Section 11-4.1 shall comply with Section 11-4.28.

[F] 907.10 Fire safety functions. Automatic fire detectors utilized for the purpose of performing fire safety functions shall be connected to the building’s fire alarm control panel where a fire alarm system is required by Section 907.2. Detectors shall, upon actuation, perform the intended function and activate the alarm notification appliances or a visible and audible supervisory signal at a constantly attended location. In buildings not required to be equipped with a fire alarm system, the automatic

fire detector shall be powered by normal electrical service and, upon actuation, perform the intended function. The detectors shall be located in accordance with Chapter 5 of NFPA 72.

[F] 907.11 Duct smoke detectors. Duct smoke detectors shall be connected to the building’s fire alarm control panel when a fire alarm system is provided. Activation of a duct smoke detector shall initiate a visible and audible supervisory signal at a constantly attended location. Duct smoke detectors shall not be used as a substitute for required open-area detection.

Exceptions:

1. The supervisory signal at a constantly attended location is not required where duct smoke detectors activate the building’s alarm notification appliances.
2. In occupancies not required to be equipped with a fire alarm system, actuation of a smoke detector shall activate a visible and audible signal in an approved location. Smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as air duct detector trouble.

[F] 907.12 Access. Access shall be provided to each detector for periodic inspection, maintenance and testing.

[F] 907.13 Fire-extinguishing systems. Automatic fire-extinguishing systems shall be connected to the building fire alarm system where a fire alarm system is required by another section of this code or is otherwise installed.

907.14 Monitoring. Fire alarm systems required by this chapter or the *Florida Fire Prevention Code* shall be monitored by an approved supervising station in accordance with NFPA 72.

Exception: Supervisory service is not required for:

1. Single- and multiple-station smoke alarms required by Section 907.2.10.
2. Smoke detectors in Group I-3 occupancies.
3. Automatic sprinkler systems in one- and two-family dwellings.

[F] 907.15 Automatic telephone-dialing devices. Automatic telephone-dialing devices used to transmit an emergency alarm shall not be connected to any fire department telephone number unless approved by the fire chief.

[F] 907.16 Acceptance tests. Upon completion of the installation of the fire alarm system, alarm notification appliances and circuits, alarm-initiating devices and circuits, supervisory-signal initiating devices and circuits, signaling line circuits, and primary and secondary power supplies shall be tested in accordance with NFPA 72.

[F] 907.17 Record of completion. A record of completion in accordance with NFPA 72 verifying that the system has been installed in accordance with the approved plans and specifications shall be provided.

[F] 907.18 Instructions. Operating, testing and maintenance instructions, and record drawings (“as built”) and equipment specifications shall be provided at an approved location.

[F] 907.19 Inspection, testing and maintenance. The maintenance and testing schedules and procedures for fire alarm and fire detection systems shall be in accordance with the *Florida Fire Prevention Code*.

SECTION 908 EMERGENCY ALARM SYSTEMS

[F] 908.1 Group H occupancies. Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided in accordance with Section 414.7.

[F] 908.2 Group H-5 occupancy. Emergency alarms for notification of an emergency condition in an HPM facility shall be provided as required in Section 415.8.4.6. A continuous gas-detection system shall be provided for HPM gases in accordance with Section 415.8.7.

[F] 908.3 Highly toxic and toxic materials. A gas detection system shall be provided to detect the presence of gas at or below the permissible exposure limit (PEL) or ceiling limit of the gas for which detection is provided. The system shall be capable of monitoring the discharge from the treatment system at or below one-half the immediately dangerous to life and health (IDLH) limit.

Exception: A gas-detection system is not required for toxic gases when the physiological warning threshold level for the gas is at a level below the accepted PEL for the gas.

[F] 908.3.1 Alarms. The gas detection system shall initiate a local alarm and transmit a signal to a constantly attended control station when a short-term hazard condition is detected. The alarm shall be both visible and audible and shall provide warning both inside and outside the area where gas is detected. The audible alarm shall be distinct from all other alarms.

Exception: Signal transmission to a constantly attended control station is not required when not more than one cylinder of highly toxic or toxic gas is stored.

[F] 908.3.2 Shutoff of gas supply. The gas detection system shall automatically close the shutoff valve at the source on gas supply piping and tubing related to the system being monitored for whichever gas is detected.

Exception: Automatic shutdown is not required for reactors utilized for the production of highly toxic or toxic compressed gases where such reactors are:

1. Operated at pressures less than 15 pounds per square inch gauge (psig) (103.4 kPa).
2. Constantly attended.
3. Provided with readily accessible emergency shutoff valves.

[F] 908.3.3 Valve closure. The automatic closure of shutoff valves shall be in accordance with the following:

1. When the gas-detection sampling point initiating the gas detection system alarm is within a gas cabinet or exhausted enclosure, the shutoff valve in the gas cabinet or exhausted enclosure for the specific gas detected shall automatically close.
2. Where the gas-detection sampling point initiating the gas detection system alarm is within a gas room and compressed gas containers are not in gas cabinets or exhausted enclosures, the shutoff valves on all gas

lines for the specific gas detected shall automatically close.

3. Where the gas-detection sampling point initiating the gas detection system alarm is within a piping distribution manifold enclosure, the shutoff valve for the compressed container of specific gas detected supplying the manifold shall automatically close.

Exception: When the gas-detection sampling point initiating the gas-detection system alarm is at a use location or within a gas valve enclosure of a branch line downstream of a piping distribution manifold, the shutoff valve in the gas valve enclosure for the branch line located in the piping distribution manifold enclosure shall automatically close.

[F] 908.4 Ozone gas-generator rooms. Ozone gas-generator rooms shall be equipped with a continuous gas-detection system that will shut off the generator and sound a local alarm when concentrations above the PEL occur.

[F] 908.5 Repair garages. A flammable-gas detection system shall be provided in repair garages for vehicles fueled by nonodorized gases in accordance with Section 406.6.6.

908.6 Refrigerant detector. Machinery rooms shall contain a refrigerant detector with an audible and visual alarm. The detector, or a sampling tube that draws air to the detector, shall be located in an area where refrigerant from a leak will concentrate. The alarm shall be actuated at a value not greater than the corresponding TLV-TWA values for the refrigerant classification indicated in the *Florida Building Code, Mechanical*. Detectors and alarms shall be placed in approved locations.

SECTION 909 SMOKE CONTROL SYSTEMS

909.1 Scope and purpose. This section applies to mechanical or passive smoke control systems when they are required by other provisions of this code. The purpose of this section is to establish minimum requirements for the design, installation and acceptance testing of smoke control systems that are intended to provide a tenable environment for the evacuation or relocation of occupants. These provisions are not intended for the preservation of contents, the timely restoration of operations or for assistance in fire suppression or overhaul activities. Smoke control systems regulated by this section serve a different purpose than the smoke- and heat-venting provisions found in Section 910. Mechanical smoke control systems shall not be considered exhaust systems under Chapter 5 of the *Florida Building Code, Mechanical*.

[F] 909.2 General design requirements. Buildings, structures or parts thereof required by this code to have a smoke control system or systems shall have such systems designed in accordance with the applicable requirements of Section 909 and the generally accepted and well-established principles of engineering relevant to the design. The construction documents shall include sufficient information and detail to adequately describe the elements of the design necessary for the proper implementation of the smoke control systems. These documents shall be accompanied by sufficient information and analysis to demonstrate compliance with these provisions.

909.3 Special inspection and test requirements. Reserved.

[F] 909.4 Analysis. A rational analysis supporting the types of smoke control systems to be employed, their methods of operation, the systems supporting them and the methods of construction to be utilized shall accompany the submitted construction documents and shall include, but not be limited to, the items indicated in Sections 909.4.1 through 909.4.6.

[F] 909.4.1 Stack effect. The system shall be designed such that the maximum probable normal or reverse stack effect will not adversely interfere with the system's capabilities. In determining the maximum probable stack effect, altitude, elevation, weather history and interior temperatures shall be used.

[F] 909.4.2 Temperature effect of fire. Buoyancy and expansion caused by the design fire in accordance with Section 909.9 shall be analyzed. The system shall be designed such that these effects do not adversely interfere with the system's capabilities.

[F] 909.4.3 Wind effect. The design shall consider the adverse effects of wind. Such consideration shall be consistent with the wind-loading provisions of Chapter 16.

[F] 909.4.4 HVAC systems. The design shall consider the effects of the heating, ventilating and air-conditioning (HVAC) systems on both smoke and fire transport. The analysis shall include all permutations of systems status. The design shall consider the effects of the fire on the HVAC systems.

[F] 909.4.5 Climate. The design shall consider the effects of low temperatures on systems, property and occupants. Air inlets and exhausts shall be located so as to prevent snow or ice blockage.

[F] 909.4.6 Duration of operation. All portions of active or passive smoke control systems shall be capable of continued operation after detection of the fire event for a period of not less than either 20 minutes or 1.5 times the calculated egress time, whichever is less.

[F] 909.5 Smoke barrier construction. Smoke barriers shall comply with Section 709, and shall be constructed and sealed to limit leakage areas exclusive of protected openings. The maximum allowable leakage area shall be the aggregate area calculated using the following leakage area ratios:

- | | |
|----------------------|-------------------|
| 1. Walls: | $A/A_w = 0.00100$ |
| 2. Exit enclosures: | $A/A_w = 0.00035$ |
| 3. All other shafts: | $A/A_w = 0.00150$ |
| 4. Floors and roofs: | $A/A_F = 0.00050$ |

where:

A = Total leakage area, square feet (m^2).

A_F = Unit floor or roof area of barrier, square feet (m^2).

A_w = Unit wall area of barrier, square feet (m^2).

The leakage area ratios shown do not include openings due to doors, operable windows or similar gaps. These shall be included in calculating the total leakage area.

[F] 909.5.1 Leakage area. The total leakage area of the barrier is the product of the smoke barrier gross area multiplied by the allowable leakage area ratio, plus the area of other openings such as gaps and operable windows. Compliance shall be determined by achieving the minimum air pressure difference across the barrier with the system in the smoke control mode for mechanical smoke control systems. Passive smoke control systems tested using other approved means such as door fan testing shall be as approved by the fire code official.

[F] 909.5.2 Opening protection. Openings in smoke barriers shall be protected by automatic-closing devices actuated by the required controls for the mechanical smoke control system. Door openings shall be protected by fire door assemblies complying with Section 715.4.3.

Exceptions:

1. Passive smoke control systems with automatic-closing devices actuated by spot-type smoke detectors listed for releasing service installed in accordance with Section 907.10.
2. Fixed openings between smoke zones that are protected utilizing the airflow method.
3. In Group I-2, where such doors are installed across corridors, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire protection-rated glazing materials in fire protection-rated frames, the area of which shall not exceed that tested. The doors shall be close-fitting within operational tolerances and shall not have undercuts, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic-closing by smoke detection in accordance with Section 715.4.7.3. Positive-latching devices are not required.
4. Group I-3.
5. Openings between smoke zones with clear ceiling heights of 14 feet (4267 mm) or greater and bank-down capacity of greater than 20 minutes as determined by the design fire size.

[F] 909.5.2.1 Ducts and air transfer openings. Ducts and air transfer openings are required to be protected with a minimum Class II, 250°F (121°C) smoke damper complying with Section 716.

[F] 909.6 Pressurization method. The primary mechanical means of controlling smoke shall be by pressure differences across smoke barriers. Maintenance of a tenable environment is not required in the smoke control zone of fire origin.

[F] 909.6.1 Minimum pressure difference. The minimum pressure difference across a smoke barrier shall be 0.05-inch water gage (0.0124 kPa) in fully sprinklered buildings.

In buildings permitted to be other than fully sprinklered, the smoke control system shall be designed to achieve pressure differences at least two times the maximum calculated pressure difference produced by the design fire.

[F] 909.6.2 Maximum pressure difference. The maximum air pressure difference across a smoke barrier shall be determined by required door-opening or closing forces. The actual force required to open exit doors when the system is in the smoke control mode shall be in accordance with Section 1008.1.2. Opening and closing forces for other doors shall be determined by standard engineering methods for the resolution of forces and reactions. The calculated force to set a side-hinged, swinging door in motion shall be determined by:

$$F = F_{dc} + K(WA\Delta P)/2(W - d) \quad \text{(Equation 9-1)}$$

where:

- A = Door area, square feet (m²).
- d = Distance from door handle to latch edge of door, feet (m).
- F = Total door opening force, pounds (N).
- F_{dc} = Force required to overcome closing device, pounds (N).
- K = Coefficient 5.2 (1.0).
- W = Door width, feet (m).
- ΔP = Design pressure difference, inches of water (Pa).

[F] 909.7 Airflow design method. When approved by the fire code official, smoke migration through openings fixed in a permanently open position, which are located between smoke control zones by the use of the airflow method, shall be permitted. The design airflow shall be in accordance with this section. Airflow shall be directed to limit smoke migration from the fire zone. The geometry of openings shall be considered to prevent flow reversal from turbulent effects.

[F] 909.7.1 Velocity. The minimum average velocity through a fixed opening shall not be less than:

$$v = 217.2 [h(T_f - T_o)/(T_f + 460)]^{1/2} \quad \text{(Equation 9-2)}$$

For SI: $v = 119.9 [h(T_f - T_o)/T_f]^{1/2}$

where:

- h = Height of opening, feet (m).
- T_f = Temperature of smoke, °F (K).
- T_o = Temperature of ambient air, °F (K).
- v = Air velocity, feet per minute (m/minute).

[F] 909.7.2 Prohibited conditions. This method shall not be employed where either the quantity of air or the velocity of the airflow will adversely affect other portions of the smoke control system, unduly intensify the fire, disrupt plume dynamics or interfere with exiting. In no case shall airflow toward the fire exceed 200 feet per minute (1.02 m/s). Where the formula in Section 909.7.1 requires airflow to exceed this limit, the airflow method shall not be used.

[F] 909.8 Exhaust method. When approved by the fire code official, mechanical smoke control for large enclosed volumes,

such as in atriums or malls, shall be permitted to utilize the exhaust method. Smoke control systems using the exhaust method shall be designed in accordance with NFPA 92B.

[F] 909.8.1 Smoke layer. The height of the lowest horizontal surface of the accumulating smoke layer shall be maintained at least 6 feet (1829 mm) above any walking surface that forms a portion of a required egress system within the smoke zone.

[F] 909.9 Design fire. The design fire shall be based on a rational analysis performed by the registered design professional and approved by the fire code official. The design fire shall be based on the analysis in accordance with Section 909.4 and this section.

[F] 909.9.1 Factors considered. The engineering analysis shall include the characteristics of the fuel, fuel load, effects included by the fire and whether the fire is likely to be steady or unsteady.

[F] 909.9.2 Separation distance. Determination of the design fire shall include consideration of the type of fuel, fuel spacing and configuration.

$$R = [Q/(12\pi q'')]^{1/2} \quad \text{(Equation 9-8)}$$

where:

- q'' = Incident radiant heat flux required for nonpiloted ignition, Btu/ft² · s (W/m²).
- Q = Heat release from fire, Btu/s (kW).
- R = Separation distance from target to center of fuel package, feet (m).

[F] 909.9.3 Heat-release assumptions. The analysis shall make use of best available data from approved sources and shall not be based on excessively stringent limitations of combustible material.

[F] 909.9.4 Sprinkler effectiveness assumptions. A documented engineering analysis shall be provided for conditions that assume fire growth is halted at the time of sprinkler activation.

[F] 909.10 Equipment. Equipment including, but not limited to, fans, ducts, automatic dampers and balance dampers, shall be suitable for its intended use, suitable for the probable exposure temperatures that the rational analysis indicates and as approved by the fire code official.

[F] 909.10.1 Exhaust fans. Components of exhaust fans shall be rated and certified by the manufacturer for the probable temperature rise to which the components will be exposed. This temperature rise shall be computed by:

$$T_s = (Q_c/mc) + (T_a) \quad \text{(Equation 9-3)}$$

where:

- c = Specific heat of smoke at smoke layer temperature, Btu/lb°F (kJ/kg · K).
- m = Exhaust rate, pounds per second (kg/s).
- Q_c = Convective heat output of fire, Btu/s (kW).
- T_a = Ambient temperature, °F (K).
- T_s = Smoke temperature, °F (K).

Exception: Reduced T_r as calculated based on the assurance of adequate dilution air.

909.10.2 Ducts. Duct materials and joints shall be capable of withstanding the probable temperatures and pressures to which they are exposed as determined in accordance with Section 909.10.1. Ducts shall be constructed and supported in accordance with the *Florida Building Code, Mechanical*. Ducts shall be leak tested to 1.5 times the maximum design pressure in accordance with nationally accepted practices. Measured leakage shall not exceed 5 percent of design flow. Results of such testing shall be a part of the documentation procedure. Ducts shall be supported directly from fire-resistance-rated structural elements of the building by substantial, noncombustible supports.

Exception: Flexible connections (for the purpose of vibration isolation) complying with the *Florida Building Code, Mechanical* that are constructed of approved fire-resistance-rated materials.

[F] 909.10.3 Equipment, inlets and outlets. Equipment shall be located so as to not expose uninvolved portions of the building to an additional fire hazard. Outside air inlets shall be located so as to minimize the potential for introducing smoke or flame into the building. Exhaust outlets shall be so located as to minimize reintroduction of smoke into the building and to limit exposure of the building or adjacent buildings to an additional fire hazard.

[F] 909.10.4 Automatic dampers. Automatic dampers, regardless of the purpose for which they are installed within the smoke control system, shall be listed and conform to the requirements of approved, recognized standards.

[F] 909.10.5 Fans. In addition to other requirements, belt-driven fans shall have 1.5 times the number of belts required for the design duty, with the minimum number of belts being two. Fans shall be selected for stable performance based on normal temperature and, where applicable, elevated temperature. Calculations and manufacturer's fan curves shall be part of the documentation procedures. Fans shall be supported and restrained by noncombustible devices in accordance with the requirements of Chapter 16. Motors driving fans shall not be operated beyond their nameplate horsepower (kilowatts), as determined from measurement of actual current draw, and shall have a minimum service factor of 1.15.

909.11 Power systems. The smoke control system shall be supplied with two sources of power. Primary power shall be from the normal building power systems. Secondary power shall be from an approved standby source complying with Chapter 27 of the *Florida Building Code, Building*. The standby power source and its transfer switches shall be in a separate room from the normal power transformers and switch gear and shall be enclosed in a room constructed of not less than 1-hour fire-resistance-rated fire barriers ventilated directly to and from the exterior. Power distribution from the two sources shall be by independent routes. Transfer to full standby power shall be automatic and within 60 seconds of failure of the primary power. The systems shall comply with Chapter 27 of the *Florida Building Code, Building*.

[F] 909.11.1 Power sources and power surges. Elements of the smoke management system relying on volatile memories or the like shall be supplied with uninterruptable power sources of sufficient duration to span a 15-minute primary power interruption. Elements of the smoke management system susceptible to power surges shall be suitably protected by conditioners, suppressors or other approved means.

[F] 909.12 Detection and control systems. Fire detection systems providing control input or output signals to mechanical smoke control systems or elements thereof shall comply with the requirements of Section 907. Such systems shall be equipped with a control unit complying with UL 864 and listed as smoke control equipment.

Control systems for mechanical smoke control systems shall include provisions for verification. Verification shall include positive confirmation of actuation, testing, manual override, the presence of power downstream of all disconnects and, through a preprogrammed weekly test sequence, report abnormal conditions audibly, visually and by printed report.

909.12.1 Wiring. In addition to meeting requirements of Chapter 27 of the *Florida Building Code, Building*, all wiring, regardless of voltage, shall be fully enclosed within continuous raceways.

[F] 909.12.2 Activation. Smoke control systems shall be activated in accordance with this section.

[F] 909.12.2.1 Pressurization, airflow or exhaust method. Mechanical smoke control systems using the pressurization, airflow or exhaust method shall have completely automatic control.

[F] 909.12.2.2 Passive method. Passive smoke control systems actuated by approved spot-type detectors listed for releasing service shall be permitted.

[F] 909.12.3 Automatic control. Where completely automatic control is required or used, the automatic-control sequences shall be initiated from an appropriately zoned automatic sprinkler system complying with Section 903.3.1.1, manual controls that are readily accessible to the fire department and any smoke detectors required by engineering analysis.

[F] 909.13 Control air tubing. Control air tubing shall be of sufficient size to meet the required response times. Tubing shall be flushed clean and dry prior to final connections and shall be adequately supported and protected from damage. Tubing passing through concrete or masonry shall be sleeved and protected from abrasion and electrolytic action.

[F] 909.13.1 Materials. Control air tubing shall be hard drawn copper, Type L, ACR in accordance with ASTM B 42, ASTM B 43, ASTM B 68, ASTM B 88, ASTM B 251 and ASTM B 280. Fittings shall be wrought copper or brass, solder type, in accordance with ASME B 16.18 or ASME B 16.22. Changes in direction shall be made with appropriate tool bends. Brass compression-type fittings shall be used at final connection to devices; other joints shall be brazed using a BCuP5 brazing alloy with solidus above 1,100°F (593°C) and liquids below 1,500°F (816°C). Brazing flux shall be used on copper-to-brass joints only.

Exception: Nonmetallic tubing used within control panels and at the final connection to devices, provided that all of the following conditions are met:

1. Tubing shall be listed by an approved agency for flame and smoke characteristics.
2. Tubing and connected devices shall be completely enclosed within galvanized or paint-grade steel enclosure of not less than 0.030 inch (0.76 mm) (No. 22 galvanized sheet gage) thickness. Entry to the enclosure shall be by copper tubing with a protective grommet of neoprene or teflon or by suitable brass compression to male-barbed adapter.
3. Tubing shall be identified by appropriately documented coding.
4. Tubing shall be neatly tied and supported within enclosure. Tubing bridging cabinet and door or moveable device shall be of sufficient length to avoid tension and excessive stress. Tubing shall be protected against abrasion. Tubing serving devices on doors shall be fastened along hinges.

[F] 909.13.2 Isolation from other functions. Control tubing serving other than smoke control functions shall be isolated by automatic isolation valves or shall be an independent system.

[F] 909.13.3 Testing. Control air tubing shall be tested at three times the operating pressure for not less than 30 minutes without any noticeable loss in gauge pressure prior to final connection to devices.

[F] 909.14 Marking and identification. The detection and control systems shall be clearly marked at all junctions, accesses and terminations.

[F] 909.15 Control diagrams. Identical control diagrams showing all devices in the system and identifying their location and function shall be maintained current and kept on file with the fire code official, the fire department and in the fire command center in a format and manner approved by the fire chief.

909.16 Fire-fighter's smoke control panel. A fire-fighter's smoke control panel for fire department emergency response purposes only shall be provided and shall include manual control or override of automatic control for mechanical smoke control systems. The panel shall be located in a fire command center complying with Section 911 in high-rise buildings or buildings with smoke protected assembly seating. In other buildings, the fire-fighter's smoke control panel shall be installed in an approved location adjacent to the fire alarm control panel. The fire-fighter's smoke control panel shall comply with Sections 909.16.1 through 909.16.3.

[F] 909.16.1 Smoke control systems. Fans within the building shall be shown on the fire-fighter's control panel. A clear indication of the direction of airflow and the relationship of components shall be displayed. Status indicators shall be provided for all smoke control equipment, annunciated by fan and zone, and by pilot-lamp-type indicators as follows:

1. Fans, dampers and other operating equipment in their normal status—WHITE.

2. Fans, dampers and other operating equipment in their off or closed status—RED.
3. Fans, dampers and other operating equipment in their on or open status—GREEN.
4. Fans, dampers and other operating equipment in a fault status—YELLOW/AMBER.

[F] 909.16.2 Smoke control panel. The fire-fighter's control panel shall provide control capability over the complete smoke-control system equipment within the building as follows:

1. ON-AUTO-OFF control over each individual piece of operating smoke control equipment that can also be controlled from other sources within the building. This includes stairway pressurization fans; smoke exhaust fans; supply, return and exhaust fans; elevator shaft fans and other operating equipment used or intended for smoke control purposes.
2. OPEN-AUTO-CLOSE control over individual dampers relating to smoke control and that are also controlled from other sources within the building.
3. ON-OFF or OPEN-CLOSE control over smoke control and other critical equipment associated with a fire or smoke emergency and that can only be controlled from the fire-fighter's control panel.

Exceptions:

1. Complex systems, where approved, where the controls and indicators are combined to control and indicate all elements of a single smoke zone as a unit.
2. Complex systems, where approved, where the control is accomplished by computer interface using approved, plain English commands.

909.16.3 Control action and priorities. The fire-fighter's control panel actions shall be as follows:

1. ON-OFF, OPEN-CLOSE control actions shall have the highest priority of any control point within the building. Once issued from the fire-fighter's control panel, no automatic or manual control from any other control point within the building shall contradict the control action. Where automatic means are provided to interrupt normal, nonemergency equipment operation or produce a specific result to safeguard the building or equipment (i.e., duct freezestats, duct smoke detectors, high-temperature cutouts, temperature-actuated linkage and similar devices), such means shall be capable of being overridden by the fire-fighter's control panel. The last control action as indicated by each fire-fighter's control panel switch position shall prevail. In no case shall control actions require the smoke control system to assume more than one configuration at any one time.

Exception: Power disconnects required by Chapter 27 of the *Florida Building Code, Building*.

2. Only the AUTO position of each three-position fire-fighter's control panel switch shall allow auto-

matic or manual control action from other control points within the building. The AUTO position shall be the NORMAL, nonemergency, building control position. Where a fire-fighter's control panel is in the AUTO position, the actual status of the device (on, off, open, closed) shall continue to be indicated by the status indicator described above. When directed by an automatic signal to assume an emergency condition, the NORMAL position shall become the emergency condition for that device or group of devices within the zone. In no case shall control actions require the smoke control system to assume more than one configuration at any one time.

[F] 909.17 System response time. Smoke-control system activation shall be initiated immediately after receipt of an appropriate automatic or manual activation command. Smoke control systems shall activate individual components (such as dampers and fans) in the sequence necessary to prevent physical damage to the fans, dampers, ducts and other equipment. For purposes of smoke control, the fire-fighter's control panel response time shall be the same for automatic or manual smoke control action initiated from any other building control point. The total response time, including that necessary for detection, shutdown of operating equipment and smoke control system startup, shall allow for full operational mode to be achieved before the conditions in the space exceed the design smoke condition. The system response time for each component and their sequential relationships shall be detailed in the required rational analysis and verification of their installed condition reported in the required final report.

[F] 909.18 Acceptance testing. Devices, equipment, components and sequences shall be individually tested. These tests, in addition to those required by other provisions of this code, shall consist of determination of function, sequence and, where applicable, capacity of their installed condition.

[F] 909.18.1 Detection devices. Smoke or fire detectors that are a part of a smoke control system shall be tested in accordance with Chapter 9 in their installed condition. When applicable, this testing shall include verification of airflow in both minimum and maximum conditions.

[F] 909.18.2 Ducts. Ducts that are part of a smoke control system shall be traversed using generally accepted practices to determine actual air quantities.

[F] 909.18.3 Dampers. Dampers shall be tested for function in their installed condition.

[F] 909.18.4 Inlets and outlets. Inlets and outlets shall be read using generally accepted practices to determine air quantities.

[F] 909.18.5 Fans. Fans shall be examined for correct rotation. Measurements of voltage, amperage, revolutions per minute (rpm) and belt tension shall be made.

[F] 909.18.6 Smoke barriers. Measurements using inclined manometers or other approved calibrated measuring devices shall be made of the pressure differences across smoke barriers. Such measurements shall be conducted for each possible smoke control condition.

[F] 909.18.7 Controls. Each smoke zone, equipped with an automatic-initiation device, shall be put into operation by the actuation of one such device. Each additional device within the zone shall be verified to cause the same sequence without requiring the operation of fan motors in order to prevent damage. Control sequences shall be verified throughout the system, including verification of override from the fire-fighter's control panel and simulation of standby power conditions.

[F] 909.18.8 Special inspections for smoke control. Smoke control systems shall be tested by a special inspector.

[F] 909.18.8.1 Scope of testing. Special inspections shall be conducted in accordance with the following:

1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.
2. Prior to occupancy and after sufficient completion for the purposes of pressure-difference testing, flow measurements, and detection and control verification.

[F] 909.18.8.2 Qualifications. Special inspection agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers.

[F] 909.18.8.3 Reports. A complete report of testing shall be prepared by the special inspector or special inspection agency. The report shall include identification of all devices by manufacturer, nameplate data, design values, measured values and identification tag or mark. The report shall be reviewed by the responsible registered design professional and, when satisfied that the design intent has been achieved, the responsible registered design professional shall seal, sign and date the report.

[F] 909.18.8.3.1 Report filing. A copy of the final report shall be filed with the fire code official and an identical copy shall be maintained in an approved location at the building.

[F] 909.18.9 Identification and documentation. Charts, drawings and other documents identifying and locating each component of the smoke control system, and describing its proper function and maintenance requirements, shall be maintained on file at the building as an attachment to the report required by Section 909.18.8.3. Devices shall have an approved identifying tag or mark on them consistent with the other required documentation and shall be dated indicating the last time they were successfully tested and by whom.

[F] 909.19 System acceptance. Buildings, or portions thereof, required by this code to comply with this section shall not be issued a certificate of occupancy until such time that the fire code official determines that the provisions of this section have been fully complied with and that the fire department has received satisfactory instruction on the operation, both automatic and manual, of the system.

Exception: In buildings of phased construction, a temporary certificate of occupancy, as approved by the fire code

official, shall be allowed provided that those portions of the building to be occupied meet the requirements of this section and that the remainder does not pose a significant hazard to the safety of the proposed occupants or adjacent buildings.

909.20 Smokeproof enclosures. Where required by Section 1020.1.7, a smokeproof enclosure shall be constructed in accordance with this section. A smokeproof enclosure shall consist of an enclosed interior exit stairway that conforms to Section 1020.1 and an open exterior balcony or ventilated vestibule meeting the requirements of this section. Where access to the roof is required by the *Florida Fire Prevention Code*, such access shall be from the smokeproof enclosure where a smokeproof enclosure is required.

909.20.1 Access. Access to the stair shall be by way of a vestibule or an open exterior balcony. The minimum dimension of the vestibule shall not be less than the required width of the corridor leading to the vestibule but shall not have a width of less than 44 inches (1118 mm) and shall not have a length of less than 72 inches (1829 mm) in the direction of egress travel.

909.20.2 Construction. The smokeproof enclosure shall be separated from the remainder of the building by not less than a 2-hour fire barrier without openings other than the required means of egress doors. The vestibule shall be separated from the stairway by not less than a 2-hour fire barrier. The open exterior balcony shall be constructed in accordance with the fire-resistance-rating requirements for floor construction.

909.20.2.1 Door closers. Doors in a smokeproof enclosure shall be self- or automatic closing by actuation of a smoke detector in accordance with Section 715.4 and shall be installed at the floor-side entrance to the smokeproof enclosure. The actuation of the smoke detector on any door shall activate the closing devices on all doors in the smokeproof enclosure at all levels. Smoke detectors shall be installed in accordance with Section 907.10.

909.20.3 Natural ventilation alternative. The provisions of Sections 909.20.3.1 through 909.20.3.3 shall apply to ventilation of smokeproof enclosures by natural means.

909.20.3.1 Balcony doors. Where access to the stairway is by way of an open exterior balcony, the door assembly into the enclosure shall be a fire door assembly in accordance with Section 715.4.

909.20.3.2 Vestibule doors. Where access to the stairway is by way of a vestibule, the door assembly into the vestibule shall be a fire door assembly complying with Section 715.4. The door assembly from the vestibule to the stairway shall have not less than a 20-minute fire protection rating complying with Section 715.4.

909.20.3.3 Vestibule ventilation. Each vestibule shall have a minimum net area of 16 square feet (1.5 m²) of opening in a wall facing an outer court, yard or public way that is at least 20 feet (6096 mm) in width.

909.20.4 Mechanical ventilation alternative. The provisions of Sections 909.20.4.1 through 909.20.4.4 shall apply

to ventilation of smokeproof enclosures by mechanical means.

909.20.4.1 Vestibule doors. The door assembly from the building into the vestibule shall be a fire door assembly complying with Section 715.4.3. The door assembly from the vestibule to the stairway shall not have less than a 20-minute fire protection rating and meet the requirements for a smoke door assembly in accordance with Section 715.4.3. The door shall be installed in accordance with NFPA 105.

909.20.4.2 Vestibule ventilation. The vestibule shall be supplied with not less than one air change per minute and the exhaust shall not be less than 150 percent of supply. Supply air shall enter and exhaust air shall discharge from the vestibule through separate, tightly constructed ducts used only for that purpose. Supply air shall enter the vestibule within 6 inches (152 mm) of the floor level. The top of the exhaust register shall be located at the top of the smoke trap but not more than 6 inches (152 mm) down from the top of the trap, and shall be entirely within the smoke trap area. Doors in the open position shall not obstruct duct openings. Duct openings with controlling dampers are permitted where necessary to meet the design requirements, but dampers are not otherwise required.

909.20.4.2.1 Engineered ventilation system. Where a specially engineered system is used, the system shall exhaust a quantity of air equal to not less than 90 air changes per hour from any vestibule in the emergency operation mode and shall be sized to handle three vestibules simultaneously. Smoke detectors shall be located at the floor-side entrance to each vestibule and shall activate the system for the affected vestibule. Smoke detectors shall be installed in accordance with Section 907.10.

909.20.4.3 Smoke trap. The vestibule ceiling shall be at least 20 inches (508 mm) higher than the door opening into the vestibule to serve as a smoke and heat trap and to provide an upward-moving air column. The height shall not be decreased unless approved and justified by design and test.

909.20.4.4 Stair shaft air movement system. The stair shaft shall be provided with a dampered relief opening and supplied with sufficient air to maintain a minimum positive pressure of 0.10 inch of water (25 Pa) in the shaft relative to the vestibule with all doors closed.

909.20.5 Stair pressurization alternative. Where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the vestibule is not required, provided that interior exit stairways are pressurized to a minimum of 0.05 inch of water (12.3 Pa) and a maximum of 0.35 inch of water (87 Pa) in the shaft relative to the building measured with all stairway doors closed under maximum anticipated stack pressures.

909.20.6 Ventilating equipment. The activation of ventilating equipment required by the alternatives in Sections 909.20.4 and 909.20.5 shall be by smoke detectors installed

at each floor level at an approved location at the entrance to the smokeproof enclosure. When the closing device for the stair shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.10.

909.20.6.1 Ventilation systems. Smokeproof enclosure ventilation systems shall be independent of other building ventilation systems. The equipment and ductwork shall comply with one of the following:

1. Equipment and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by 2-hour fire barriers.
2. Equipment and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by 2-hour fire barriers.
3. Equipment and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by 2-hour fire barriers.

909.20.6.2 Standby power. Mechanical vestibule and stair shaft ventilation systems and automatic fire detection systems shall be powered by an approved standby power system conforming to Section 403.10.1 and Chapter 27.

909.20.6.3 Acceptance and testing. Before the mechanical equipment is approved, the system shall be tested in the presence of the building official to confirm that the system is operating in compliance with these requirements.

SECTION 910 SMOKE AND HEAT VENTS

[F] 910.1 General. Where required by this code or otherwise installed, smoke and heat vents, or mechanical smoke exhaust systems, and draft curtains shall conform to the requirements of this section.

Exceptions:

1. Frozen food warehouses used solely for storage of Class I and II commodities where protected by an approved automatic sprinkler system.
2. Where areas of buildings are equipped with early suppression fast-response (ESFR) sprinklers, automatic smoke and heat vents shall not be required within these areas.

[F] 910.2 Where required. Smoke and heat vents shall be installed in the roofs of one-story buildings or portions thereof occupied for the uses set forth in Sections 910.2.1 through 910.2.3.

[F] 910.2.1 Group F-1 or S-1. Buildings and portions thereof used as a Group F-1 or S-1 occupancy having more than 50,000 square feet (4645 m²) in undivided area.

Exception: Group S-1 aircraft repair hangars.

[F] 910.2.2 High-piled combustible storage. Buildings and portions thereof containing high-piled combustible stock or rack storage in any occupancy group in accordance with Section 413 and the *Florida Fire Prevention Code*.

[F] 910.2.3 Exit access travel distance increase. Buildings and portions thereof used as a Group F-1 or S-1 occupancy where the maximum exit access travel distance is increased in accordance with Section 1016.2.

[F] 910.3 Design and installation. The design and installation of smoke and heat vents and draft curtains shall be as specified in Sections 910.3.1 through 910.3.5.2 and Table 910.3.

[F] 910.3.1 Design. Smoke and heat vents shall be listed and labeled to indicate compliance with UL 793.

[F] 910.3.2 Vent operation. Smoke and heat vents shall be capable of being operated by approved automatic and manual means. Automatic operation of smoke and heat vents shall conform to the provisions of Sections 910.3.2.1 through 910.3.2.3.

[F] 910.3.2.1 Gravity-operated drop-out vents. Automatic smoke and heat vents containing heat-sensitive glazing designed to shrink and drop out of the vent opening when exposed to fire shall fully open within 5 minutes after the vent cavity is exposed to a simulated fire, represented by a time-temperature gradient that reaches an air temperature of 500°F (260°C) within 5 minutes.

[F] 910.3.2.2 Sprinklered buildings. Where installed in buildings provided with an approved automatic sprinkler system, smoke and heat vents shall be designed to operate automatically.

[F] 910.3.2.3 Nonsprinklered buildings. Where installed in buildings not provided with an approved automatic sprinkler system, smoke and heat vents shall operate automatically by actuation of a heat-responsive device rated at between 100°F (38°C) and 220°F (104°C) above ambient.

Exception: Gravity-operated drop-out vents complying with Section 910.3.2.1

[F] 910.3.3 Vent dimensions. The effective venting area shall not be less than 16 square feet (1.5 m²) with no dimension less than 4 feet (1219 mm), excluding ribs or gutters having a total width not exceeding 6 inches (152 mm).

[F] 910.3.4 Vent locations. Smoke and heat vents shall be located 20 feet (6096 mm) or more from adjacent lot lines and fire walls and 10 feet (3048 mm) or more from fire barrier walls. Vents shall be uniformly located within the roof area above high-piled storage areas, with consideration given to roof pitch, draft curtain location, sprinkler location and structural members.

[F] 910.3.5 Draft curtains. Where required by Table 910.3, draft curtains shall be provided in accordance with this section.

Exception: Where areas of buildings are equipped with ESFR sprinklers, draft curtains shall not be provided within these areas. Draft curtains shall only be provided at the separation between the ESFR sprinklers and the conventional sprinklers.

[F] 910.3.5.1 Construction. Draft curtains shall be constructed of sheet metal, lath and plaster, gypsum board or other approved materials which provide equivalent performance to resist the passage of smoke. Joints and connections shall be smoke tight.

[F] 910.3.5.2 Location and depth. The location and minimum depth of draft curtains shall be in accordance with Table 910.3.

[F] 910.4 Mechanical smoke exhaust. Where approved by the fire code official, engineered mechanical smoke exhaust shall be an acceptable alternate to smoke and heat vents.

[F] 910.4.1 Location. Exhaust fans shall be uniformly spaced within each draft-curtained area and the maximum distance between fans shall not be greater than 100 feet (30 480 mm).

[F] 910.4.2 Size. Fans shall have a maximum individual capacity of 30,000 cfm (14.2 m³/s). The aggregate capacity of smoke exhaust fans shall be determined by the equation:

$$C = A \times 300 \quad \text{(Equation 9-4)}$$

where:

C = Capacity of mechanical ventilation required, in cubic feet per minute (m³/s).

A = Area of roof vents provided in square feet (m²) in accordance with Table 910.3.

[F] 910.4.3 Operation. Mechanical smoke exhaust fans shall be automatically activated by the automatic sprinkler system or by heat detectors having operating characteristics equivalent to those described in Section 910.3.2. Individual manual controls of each fan unit shall also be provided.

[F] 910.4.4 Wiring and control. Wiring for operation and control of smoke exhaust fans shall be connected ahead of the main disconnect and protected against exposure to temperatures in excess of 1,000°F (538°C) for a period of not less than 15 minutes. Controls shall be located so as to be immediately accessible to the fire service from the exterior of the building and protected against interior fire exposure by fire barriers having a fire-resistance rating not less than 1 hour.

[F] 910.4.5 Supply air. Supply air for exhaust fans shall be provided at or near the floor level and shall be sized to provide a minimum of 50 percent of required exhaust. Open-

**[F] TABLE 910.3
REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT VENTS^a**

OCCUPANCY GROUP AND COMMODITY CLASSIFICATION	DESIGNATED STORAGE HEIGHT (feet)	MINIMUM DRAFT CURTAIN DEPTH (feet)	MAXIMUM AREA FORMED BY DRAFT CURTAINS (square feet)	VENT-AREA-TO-FLOOR-AREA RATIO ^c	MAXIMUM SPACING OF VENT CENTERS (feet)	MAXIMUM DISTANCE TO VENTS FROM WALL OR DRAFT CURTAINS ^b (feet)
Group F-1 and S-1	—	0.2 × H ^d but ≥ 4	50,000	1:100	120	60
High-piled Storage (see Section 910.2.2) I-IV (Option 1)	≤ 20	6	10,000	1:100	100	60
	> 20 ≤ 40	6	8,000	1:75	100	55
High-piled Storage (see Section 910.2.2) I-IV (Option 2)	≤ 20	4	3,000	1:75	100	55
	> 20 ≤ 40	4	3,000	1:50	100	50
High-piled Storage (see Section 910.2.2) High hazard (Option 1)	≤ 20	6	6,000	1:50	100	50
	> 20 ≤ 30	6	6,000	1:40	90	45
High-piled Storage (see Section 910.2.2) High hazard (Option 2)	≤ 20	4	4,000	1:50	100	50
	> 20 ≤ 30	4	2,000	1:30	75	40

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

- a. Requirements for rack storage heights in excess of those indicated shall be in accordance with the *Florida Fire Prevention Code*. For solid-piled storage heights in excess of those indicated, an approved engineered design shall be used.
- b. The distance specified is the maximum distance from any vent in a particular draft curtained area to walls or draft curtains which form the perimeter of the draft curtained area.
- c. Where draft curtains are not required, the vent-area-to-floor-area ratio shall be calculated based on a minimum draft curtain depth of 6 feet (Option 1).
- d. “H” is the height of the vent, in feet, above the floor.

ings for supply air shall be uniformly distributed around the periphery of the area served.

[F] 910.4.6 Interlocks. In combination comfort air-handling/smoke removal systems or independent comfort air-handling systems, fans shall be controlled to shut down in accordance with the approved smoke control sequence.

SECTION 911 FIRE COMMAND CENTER

[F] 911.1 Features. Where required by other sections of this code, a fire command center for fire department operations shall be provided. The location and accessibility of the fire command center shall be approved by the fire department. The fire command center shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with Section 706 or horizontal assembly constructed in accordance with Section 711, or both. The room shall be a minimum of 96 square feet (9 m²) with a minimum dimension of 8 feet (2438 mm). A layout of the fire command center and all features required by the section to be contained therein shall be submitted for approval prior to installation. The fire command center shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system unit.
2. The fire department communications unit.
3. Fire detection and alarm system annunciator unit.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air-handling systems.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting equipment and fire department access.
13. Worktable.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.

SECTION 912 FIRE DEPARTMENT CONNECTIONS

[F] 912.1 Installation. Fire department connections shall be installed in accordance with the NFPA standard applicable to the system design and shall comply with Sections 912.2 through 912.5.

[F] 912.2 Location. With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be approved.

[F] 912.2.1 Visible location. Fire department connections shall be located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department vehicle access or as otherwise approved by the fire code official.

[F] 912.2.2 Existing buildings. On existing buildings, wherever the fire department connection is not visible to approaching fire apparatus, the fire department connection shall be indicated by an approved sign mounted on the street front or on the side of the building. Such sign shall have the letters "FDC" at least 6 inches (152 mm) high and words in letters at least 2 inches (51 mm) high or an arrow to indicate the location. All such signs shall be subject to the approval of the fire code official.

[F] 912.3 Access. Immediate access to fire department connections shall be maintained at all times and without obstruction by fences, bushes, trees, walls or any other object for a minimum of 3 feet (914 mm).

[F] 912.3.1 Locking fire department connection caps. The fire code official is authorized to require locking caps on fire department connections for water-based fire protection systems where the responding fire department carries appropriate key wrenches for removal.

[F] 912.4 Signs. A metal sign with raised letters at least 1 inch (25 mm) in size shall be mounted on all fire department connections serving automatic sprinklers, standpipes or fire pump connections. Such signs shall read: AUTOMATIC SPRINKLERS, STANDPIPES or TEST CONNECTION, or a combination thereof as applicable.

[P] 912.5 Backflow protection. The potable water supply to automatic sprinkler and standpipe systems shall be protected against backflow as required by the *Florida Building Code, Plumbing*.

FLORIDA BUILDING CODE

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CHAPTER 10

MEANS OF EGRESS

SECTION 1001 ADMINISTRATION

1001.1 General. Buildings or portions thereof shall be provided with a means of egress system as required by this chapter. The provisions of this chapter shall control the design, construction and arrangement of means of egress components required to provide an approved means of egress from structures and portions thereof.

1001.2 Minimum requirements. It shall be unlawful to alter a building or structure in a manner that will reduce the number of exits or the capacity of the means of egress to less than required by this code.

1001.3 Maintenance. Means of egress shall be maintained in accordance with the *Florida Fire Prevention Code*.

1001.4 Alterations. A building shall not hereafter be altered to reduce the capacity of the means of egress to less than required by this chapter nor shall any change of occupancy be made in any building unless such building conforms to the requirements of this chapter.

Exception: Existing stairs shall be permitted to remain in use provided they comply with the requirements of the building code in effect at the time of original construction.

1001.5 Where approved by the building official, existing stairs shall be permitted to be rebuilt in accordance with the dimensional criteria of the building code in effect at the time of original construction provided:

1. Handrails comply with Section 1009.11, and,
2. Guardrails comply with Section 1012, and,
3. The elevation of the floor surfaces on both sides of the door complies with Section 1008.1.4.

1001.6 Special egress requirements by occupancy. The general requirements of Chapter 10 apply to all occupancies except as modified for specific occupancies in accordance with Section 1024 and Sections 1026 through 1033.

SECTION 1002 DEFINITIONS

1002.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

ACCESSIBLE MEANS OF EGRESS. A continuous and unobstructed way of egress travel from any accessible point in a building or facility to a public way.

AISLE. An exit access component that defines and provides a path of egress travel.

AISLE ACCESSWAY. That portion of an exit access that leads to an aisle.

ALTERNATING TREAD DEVICE. A device that has a series of steps between 50 and 70 degrees (0.87 and 1.22 rad) from horizontal, usually attached to a center support rail in an alternating manner so that the user does not have both feet on the same level at the same time.

AREA OF REFUGE. An area where persons unable to use stairways can remain temporarily to await instructions or assistance during emergency evacuation.

BLEACHERS. Tiered seating facilities.

CIRCULAR STAIRS. A stairway with steps that result in a sweeping circular or curved pattern, but not spiral stairs.

COMMON PATH OF EGRESS TRAVEL. That portion of exit access which the occupants are required to traverse before two separate and distinct paths of egress travel to two exits are available. Paths that merge are common paths of travel. Common paths of egress travel shall be included within the permitted travel distance.

CORRIDOR. An enclosed exit access component that defines and provides a path of egress travel to an exit.

DOOR, BALANCED. A door equipped with double-pivoted hardware so designed as to cause a semicounterbalanced swing action when opening.

EGRESS COURT. A court or yard which provides access to a public way for one or more exits.

EMERGENCY ESCAPE AND RESCUE OPENING. An operable window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

EXIT. That portion of a means of egress system which is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives as required to provide a protected path of egress travel between the exit access and the exit discharge. Exits include exterior exit doors at ground level, exit enclosures, exit passageways, exterior exit stairs, exterior exit ramps and horizontal exits.

EXIT, HORIZONTAL. A path of egress travel from one building to an area in another building on approximately the same level, or a path of egress travel through or around a wall or partition to an area on approximately the same level in the same building, which affords safety from fire and smoke from the area of incidence and areas communicating therewith.

EXIT ACCESS. That portion of a means of egress system that leads from any occupied portion of a building or structure to an exit.

EXIT DISCHARGE. That portion of a means of egress system between the termination of an exit and a public way.

EXIT DISCHARGE, LEVEL OF. The lowest level having at least 50 percent of the number of exits and capacity of exits discharging to the exterior at grade or story with the least change in elevation to grade, provided no other story has 50 percent of

its exits or egress capacity discharging to the exterior at the grade.

EXIT ENCLOSURE. An exit component that is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives, and provides for a protected path of egress travel in a vertical or horizontal direction to the exit discharge or the public way.

EXIT PASSAGEWAY. An exit component that is separated from all other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives, and provides for a protected path of egress travel in a horizontal direction to the exit discharge or the public way.

FIRE EXIT HARDWARE. Panic hardware that is listed for use on fire door assemblies.

FLOOR AREA, GROSS. The floor area within the inside perimeter of the exterior walls of the building under consideration, exclusive of vent shafts and courts, without deduction for corridors, stairways, closets, the thickness of interior walls, columns or other features. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the usable area under the horizontal projection of the roof or floor above. The gross floor area shall not include shafts with no openings or interior courts.

FLOOR AREA, NET. The actual occupied area not including unoccupied accessory areas such as corridors, stairways, toilet rooms, mechanical rooms and closets.

FOLDING AND TELESCOPIC SEATING. Tiered seating facilities having an overall shape and size that are capable of being reduced for purposes of moving or storing.

GRANDSTAND. Tiered seating facilities.

GUARD. A building component or a system of building components located at or near the open sides of elevated walking surfaces that minimizes the possibility of a fall from the walking surface to a lower level.

HANDRAIL. A horizontal or sloping rail intended for grasping by the hand for guidance or support.

MEANS OF EGRESS. A continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building or structure to a public way. A means of egress consists of three separate and distinct parts: the exit access, the exit and the exit discharge.

MEANS OF ESCAPE. A way out of a building or structure that does not conform to the strict definition of means of egress but does provide an alternate way out. A means of escape consists of a door, stairway, passage or hall providing a way of unobstructed travel to the outside at street or ground level that is independent of and remotely located from the means of egress. It may also consist of a passage through an adjacent nonlockable space, independent of and remotely located from the means of egress, to any approved exit.

MERCHANDISE PAD. A merchandise pad is an area for display of merchandise surrounded by aisles, permanent fixtures or walls. Merchandise pads contain elements such as nonfixed and moveable fixtures, cases, racks, counters and partitions as indicated in Section 105.2 from which customers browse or shop.

NOSING. The leading edge of treads of stairs and of landings at the top of stairway flights.

OCCUPANT LOAD. The number of persons for which the means of egress of a building or portion thereof is designed.

PANIC HARDWARE. A door-latching assembly incorporating a device that releases the latch upon the application of a force in the direction of egress travel.

PUBLIC WAY. A street, alley or other parcel of land open to the outside air leading to a street, that has been deeded, dedicated or otherwise permanently appropriated to the public for public use and which has a clear width and height of not less than 10 feet (3048 mm).

RAMP. A walking surface that has a running slope steeper than one unit vertical in 20 units horizontal (5-percent slope).

SCISSOR STAIR. Two interlocking stairways providing two separate paths of egress located within one stairwell enclosure.

SMOKE-PROTECTED ASSEMBLY SEATING. Seating served by means of egress that is not subject to smoke accumulation within or under a structure.

STAIR. A change in elevation, consisting of one or more risers.

STAIRWAY. One or more flights of stairs, either exterior or interior, with the necessary landings and platforms connecting them, to form a continuous and uninterrupted passage from one level to another.

STAIRWAY, EXTERIOR. A stairway that is open on at least one side, except for required structural columns, beams, handrails and guards. The adjoining open areas shall be either yards, courts or public ways. The other sides of the exterior stairway need not be open.

STAIRWAY, INTERIOR. A stairway not meeting the definition of an exterior stairway.

STAIRWAY, SPIRAL. A stairway having a closed circular form in its plan view with uniform section-shaped treads attached to and radiating from a minimum-diameter supporting column.

WINDER. A tread with nonparallel edges.

SECTION 1003 GENERAL MEANS OF EGRESS

1003.1 Applicability. The general requirements specified in Sections 1003 through 1013 shall apply to all three elements of the means of egress system, in addition to those specific requirements for the exit access, the exit and the exit discharge detailed elsewhere in this chapter.

1003.2 Ceiling height. The means of egress shall have a ceiling height of not less than 7 feet 6 inches (2286 mm).

Exceptions:

1. Sloped ceilings in accordance with Section 1208.2.
2. Ceilings of dwelling units and sleeping units within residential occupancies in accordance with Section 1208.2.

3. Allowable projections in accordance with Section 1003.3.
4. Stair headroom in accordance with Section 1009.2.
5. Door height in accordance with Section 1008.1.1.

1003.3 Protruding objects. Protruding objects shall comply with the requirements of Sections 1003.3.1 through 1003.3.4.

1003.3.1 Headroom. Protruding objects are permitted to extend below the minimum ceiling height required by Section 1003.2 provided a minimum headroom of 80 inches (2032 mm) shall be provided for any walking surface, including walks, corridors, aisles and passageways. Not more than 50 percent of the ceiling area of a means of egress shall be reduced in height by protruding objects.

Exception: Door closers and stops shall not reduce headroom to less than 78 inches (1981 mm).

A barrier shall be provided where the vertical clearance is less than 80 inches (2032 mm) high. The leading edge of such a barrier shall be located 27 inches (686 mm) maximum above the floor.

1003.3.2 Free-standing objects. A free-standing object mounted on a post or pylon shall not overhang that post or pylon more than 4 inches (102 mm) where the lowest point of the leading edge is more than 27 inches (686 mm) and less than 80 inches (2032 mm) above the walking surface. Where a sign or other obstruction is mounted between posts or pylons and the clear distance between the posts or pylons is greater than 12 inches (305 mm), the lowest edge of such sign or obstruction shall be 27 inches (685 mm) maximum or 80 inches (2030 mm) minimum above the finished floor or ground.

Exception: This requirement shall not apply to sloping portions of handrails serving stairs and ramps.

1003.3.3 Horizontal projections. Elements cannot project over a walking surface more than 4 inches (102 mm) when they are located between 27 and 80 inches (686 and 2032 mm) above the floor. Handrails can project up to 4½ inches (114 mm) from the wall.

1003.3.4 Clear width. For accessibility provisions related to protruding objects, refer to Section 11-4.4 as provided in Section 1003.3.

1003.4 Floor surface. Walking surfaces shall be slip resistant under foreseeable conditions. The walking surface of each element in the means of egress shall be uniformly slip resistant along the natural path of travel.

1003.5 Elevation change. Change in level in the means of egress shall be either by a ramp or a stair. The presence and location of ramped walkways shall be readily apparent.

1003.5.1 Where a change in level means of egress not exceeding 21 inches (533 mm) is achieved by a stair, the minimum tread depth of such stair shall be 13 inches (330 mm) and the presence and location of each step shall be readily apparent.

Exception: Within dwelling level.

1003.5.2 Where change in elevation of 12 inches (305 mm) or less occurs in exit access corridors, exits and exit dis-

charge, ramps complying with Section 1010 shall be provided.

Exception: Within dwelling level.

1003.5.3 Accessibility. For accessibility provisions related to changes in levels, see Section 11-4.3.8.

1003.6 Means of egress continuity. The path of egress travel along a means of egress shall not be interrupted by any building element other than a means of egress component as specified in this chapter. Obstructions shall not be placed in the required width of a means of egress except projections permitted by this chapter. The required capacity of a means of egress system shall not be diminished along the path of egress travel.

1003.7 Elevators, escalators and moving walks. Elevators, escalators and moving walks shall not be used as a component of a required means of egress from any other part of the building.

Exception: Elevators used as an accessible means of egress in accordance with Section 1007.4.

SECTION 1004 OCCUPANT LOAD

1004.1 Design occupant load. In determining means of egress requirements, the number of occupants for whom means of egress facilities shall be provided shall be determined in accordance with this section. Where occupants from accessory areas egress through a primary space, the calculated occupant load for the primary space shall include the total occupant load of the primary space plus the number of occupants egressing through it from the accessory area.

Exceptions:

1. In a special purpose factory-industrial occupancy, the occupant load shall be the maximum number of persons to occupy the area under any probable conditions.
2. The occupant load for towers shall be the number of persons expected to occupy the space, with spaces not subject to human occupancy because of machinery or equipment excluded from the gross area calculation.

1004.1.1 Areas without fixed seating. The number of occupants shall be computed at the rate of one occupant per unit of area as prescribed in Table 1004.1.1. For areas without fixed seating, the occupant load shall not be less than that number determined by dividing the floor area under consideration by the occupant per unit of area factor assigned to the occupancy as set forth in Table 1004.1.1. Where an intended use is not listed in Table 1004.1.1, the building official shall establish a use based on a listed use that most nearly resembles the intended use.

Exception: Where approved by the building official, the actual number of occupants for whom each occupied space, floor or building is designed, although less than those determined by calculation, shall be permitted to be used in the determination of the design occupant load.

1004.2 Increased occupant load. The occupant load permitted in any building, or portion thereof, is permitted to be increased from that number established for the occupancies in Table 1004.1.1,

provided that all other requirements of the code are also met based on such modified number and the occupant load does not exceed one occupant per 7 square feet (0.65 m²) of occupiable floor space. Where required by the building official, an approved aisle, seating or fixed equipment diagram substantiating any increase in occupant load shall be submitted. Where required by the building official, such diagram shall be posted.

1004.3 Posting of occupant load. Every room or space that is an assembly occupancy shall have the occupant load of the room or space posted in a conspicuous place, near the main exit or exit access doorway from the room or space. Posted signs shall be of an approved legible permanent design and shall be maintained by the owner or authorized agent.

1004.4 Exiting from multiple levels. Where exits serve more than one floor, only the occupant load of each floor considered individually shall be used in computing the required capacity of the exits at that floor, provided that the exit capacity shall not decrease in the direction of egress travel.

1004.5 Egress convergence. Where means of egress from floors above and below converge at an intermediate level, the capacity of the means of egress from the point of convergence shall not be less than the sum of the two floors.

**TABLE 1004.1.1
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT**

FUNCTION OF SPACE	FLOOR AREA IN SQ FT PER OCCUPANT
Accessory storage areas, mechanical equipment room	300 gross
Agricultural building	300 gross
Aircraft hangars	500 gross
Airport terminal	
Baggage claim	20 gross
Baggage handling	300 gross
Concourse	100 gross
Waiting areas	15 gross
Assembly	
Gaming floors (keno, slots, etc.)	11 gross
Assembly with fixed seats	See Section 1004.7
Assembly without fixed seats	
Concentrated (chairs only—not fixed)	7 net
Standing space	5 net
Unconcentrated (tables and chairs)	15 net
Bowling centers, allow 5 persons for each lane including 15 feet of runway, and for additional areas	7 net
Business areas	100 gross
Courtrooms—other than fixed seating areas	40 net
Day care	20 net
Dormitories	50 gross
Educational	
Classroom area	20 net
Shops and other vocational room areas	50 net

(continued)

**TABLE 1004.1.1—continued
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT**

Exercise rooms	50 gross
Exercise rooms with equipment	50 gross
Exercise rooms without equipment	15 gross
H-5 Fabrication and manufacturing areas	200 gross
Industrial areas	100 gross
Institutional areas	
Inpatient treatment areas	240 gross
Outpatient areas	100 gross
Sleeping areas	120 gross
Kitchens, commercial	200 gross
Library	
Reading rooms	50 net
Stack area	100 gross
Locker rooms	50 gross
Mercantile	
Areas on other floors	60 gross
Basement and grade floor areas	30 gross
Multiple street floors - each (Note 1)	40 gross
Storage, stock, shipping areas	300 gross
Parking garages	200 gross
Residential	200 gross
Skating rinks, swimming pools	
Rink and pool	50 gross
Swimming pool deck	30 gross
Swimming pool water surface	50 gross
Decks	15 gross
Stages and platforms	15 net
Warehouses	500 gross

For SI: 1 square foot = 0.0929 m².

- For the purpose of determining occupant load in mercantile occupancies where, due to differences in grade of streets on different sides, two or more floors directly accessible from streets exist, each such floor shall be considered a street floor. The occupant load factor shall be one person for each 40 square feet (3.7 m²) of gross floor area of sales space.
- For any food court or other assembly use areas located in the mall that are not included as a portion of the gross leasable area of the mall buildings, the occupant load is calculated based on the occupant load factor for that use as specified in Table 1004.1.1. The remaining mall area is not required to be assigned an occupant load.

1004.6 Mezzanine levels. The occupant load of a mezzanine level with egress onto a room or area below shall be added to that room or area's occupant load, and the capacity of the exits shall be designed for the total occupant load thus established.

1004.7 Fixed seating. For areas having fixed seats and aisles, the occupant load shall be determined by the number of fixed seats installed therein. The occupant load for areas in which fixed seating is not installed, such as waiting spaces and wheelchair spaces, shall be determined in accordance with Section 1004.1.1 and added to the number of fixed seats.

For areas having fixed seating without dividing arms, the occupant load shall not be less than the number of seats based on one person for each 18 inches (457 mm) of seating length.

The occupant load of seating booths shall be based on one person for each 24 inches (610 mm) of booth seat length measured at the backrest of the seating booth.

1004.8 Outdoor areas. Yards, patios, courts and similar outdoor areas accessible to and usable by the building occupants shall be provided with means of egress as required by this chapter. The occupant load of such outdoor areas shall be assigned by the building official in accordance with the anticipated use. Where outdoor areas are to be used by persons in addition to the occupants of the building, and the path of egress travel from the outdoor areas passes through the building, means of egress requirements for the building shall be based on the sum of the occupant loads of the building plus the outdoor areas.

Exceptions:

1. Outdoor areas used exclusively for service of the building need only have one means of egress.
2. Both outdoor areas associated with Group R-3 and individual dwelling units of Group R-2.

1004.9 Multiple occupancies. Where a building contains two or more occupancies, the means of egress requirements shall apply to each portion of the building based on the occupancy of that space. Where two or more occupancies utilize portions of the same means of egress system, those egress components shall meet the more stringent requirements of all occupancies that are served.

**SECTION 1005
EGRESS WIDTH**

1005.1 Minimum required egress width. The means of egress width shall not be less than required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by the factors in Table 1005.1 and not less than specified elsewhere in this code. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.

Exception: Means of egress complying with Section 1025.

**TABLE 1005.1
EGRESS WIDTH PER OCCUPANT SERVED**

OCCUPANCY	WITHOUT SPRINKLER SYSTEM		WITH SPRINKLER SYSTEM ^a	
	Stairways (inches per occupant)	Other egress components (inches per occupant)	Stairways (inches per occupant)	Other egress components (inches per occupant)
Occupancies other than those listed below	0.3	0.2	0.3	0.2
Hazardous: H-1, H-2, H-3 and H-4	0.7	0.4	0.7	0.4
Health care	0.6	0.5	0.3	0.2
Institutional: I-2	NA	NA	0.4	0.2

For SI: 1 inch = 25.4 mm. NA = Not applicable.

a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

1005.2 Door encroachment. Doors opening into the path of egress travel shall not reduce the required width to less than one-half during the course of the swing. When fully open, the door shall not project more than 7 inches (178 mm) into the required width.

Exception: The restrictions on a door swing shall not apply to doors within individual dwelling units and sleeping units of Group R-2 and dwelling units of Group R-3.

**SECTION 1006
MEANS OF EGRESS ILLUMINATION**

1006.1 Means of egress illumination.

1006.1.1 Illumination of means of egress shall be provided in accordance with this section for every building and structure. For the purposes of this requirement, exit access shall include only designated stairs, aisles, corridors, ramps, escalators and passageways leading to an exit. For the purposes of this requirement, exit discharge shall include only designated stairs, aisles, corridors, ramps, escalators, walkways and exit passageways leading to a public way.

Exceptions:

1. When approved by the building official, illumination of means of egress shall not be required in industrial and storage occupancies that are occupied only during daylight hours, with skylights or windows arranged to provide the required level of illumination on all portions of the means of egress during these hours.
2. Assembly occupancy private party tents of 1,200 square feet (111 m²) or less shall not be required to provide illumination of means of egress.
3. Open structures shall not be required to provide illumination of means of egress.
4. Towers occupied by not more than three persons shall not be required to provide illumination of means of egress.

1006.1.2 Illumination of means of egress shall be continuous during the time that the conditions of occupancy require that the means of egress be available for use. Artificial lighting shall be employed at such places and for such periods of time as required to maintain the illumination to the minimum criteria values herein specified.

Exceptions: Automatic motion sensor-type lighting switches shall be permitted within the means of egress, provided that switch controllers are equipped for fail-safe operation, illumination timers are set for a minimum 15-minute duration and the motion sensor is activated by any occupant movement in the area served by the lighting units.

1006.1.3 The floors and other walking surfaces within an exit and within the portions of the exit access and exit discharge designated in Section 1006.1.1 shall be illuminated to values of at least 1 footcandle (10 lux) measured at the

floor. During conditions of stair use, the minimum illumination for new stairs shall be at least 108 lux (10 foot-candle), measured at the walking surface.

Exception: In assembly occupancies, the illumination of the floors of exit access shall be at least 0.2 footcandle (2 lux) during periods of performances or projections involving directed light.

1006.1.4 Required illumination shall be arranged so that the failure of any single lighting unit will not result in an illumination level in any designated area of less than 0.2 footcandle (2 lux).

1006.1.5 The equipment or units installed to meet the requirements of Section 1006.3 shall be permitted also to serve the function of illumination of means of egress, provided that all requirements of Section 1006.1 for such illumination are met.

1006.1.6 Sources of illumination.

1006.1.6.1 Illumination of means of egress shall be from a source of reasonably ensured reliability.

1006.1.6.2 Battery-operated electric lights and other types of portable lamps or lanterns shall not be used for primary illumination of means of egress. Battery-operated electric lights shall be permitted to be used as an

emergency source to the extent permitted under Section 1006.2.3.4.

1006.2 Emergency lighting and standby power.

1006.2.1 Emergency lighting facilities for means of egress shall be provided in accordance with this section for the following:

1. Every building or structure where required in Table 1006.
2. Windowless and underground structures.

Exception: One- and two-family dwellings.
3. High-rise structures.
4. At doors equipped with delayed egress locks.
5. The stair shaft and vestibule of smokeproof enclosures. A standby generator that is installed for the smokeproof enclosure mechanical ventilation equipment shall be permitted to be used for such stair shaft and vestibule power supply.

For the purposes of this requirement, exit access shall include only designated stairs, aisles, corridors, ramps, escalators and passageways leading to an exit. For the purposes of this requirement, exit discharge shall include only designated stairs, ramps, aisles, walkways and escalators leading to a public way.

**TABLE 1006
EMERGENCY LIGHTING REQUIREMENTS**

OCCUPANCY	CONDITIONS	EXCEPTIONS
Assembly		Private party tents < 1200 sq ft
Educational	For interior stairs and corridors, normally occupied spaces, flexible and open-plan area, interior or windowless portions, shops and labs	Exempted from administrative areas, general classrooms, mechanical rooms and storage rooms
Group I-1 and I-2	If using life-support systems, supply the required power from life safety branch of electricals as required by NFPA 99	None
Outpatient clinics, ambulatory	If using life-support systems for other than emergency purposes, supply the required power essentials electrical system as required by NFPA 99	None
Group I-3	None	None
Hotels and dormitories	> 25 rooms	All rooms direct to grade
Apartment buildings	>12 units or >3 stories	All apartments direct to grade
Group R-4, large facilities	>25 rooms	All rooms direct to grade
Mercantile	>1 story > 3000 sq ft gross sales area and malls	None
Business	>2 stories above LED, or ≥ 50 people above or below LED, or ≥ 300 people total	None
Industrial	None	When approved by the building official, special purpose without routine occupancy or daylight operations with windows
Storage	None	When approved by the building official, not normally occupied or daylight operations with windows
Day care centers	For interior stairs and corridors, normally occupied spaces, flexible and open-plan area, interior or windowless portions, shops and labs	Exempted from administrative areas, general classrooms, mechanical rooms and storage rooms

For SI: 1 square foot = 0.0929 m².

Exceptions:

1. Towers occupied by three or fewer persons shall be exempt from emergency lighting requirements.
2. Locations in towers not routinely inhabited by humans shall be exempt from emergency lighting requirements.
3. When approved by the building official, illumination of means of egress shall not be required in towers that are occupied only during daylight hours, with windows arranged to provide the required level of illumination on all portions of the means of egress during these hours.
4. Water-surrounded structures in locations not routinely inhabited by humans shall be exempt from emergency lighting requirements.
5. When approved by the building official, illumination of means of egress shall not be required in water-surrounded structures that are occupied only during daylight hours, with windows arranged to provide the required level of illumination on all portions of the means of egress during these hours.

1006.2.2 Where maintenance of illumination depends upon changing from one energy source to another, a delay of not more than 10 seconds shall be permitted.

1006.2.3 Performance of system.

1006.2.3.1 Emergency illumination shall be provided for a period of hours $1\frac{1}{2}$ in the event of failure of normal lighting. Emergency lighting facilities shall be arranged to provide initial illumination that is at least an average of 1 footcandle (10 lux) and a minimum at any point of 0.1 footcandle (1 lux) measured along the path of egress at floor level. Illumination levels shall be permitted to decline to 0.6 footcandle (6 lux) average and a minimum at any point of 0.06 footcandle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40:1 shall not be exceeded.

1006.2.3.2 The emergency lighting system shall be arranged to provide the required illumination automatically in the event of any interruption of normal lighting, such as any failure of public utility or other outside electrical power supply; opening of a circuit breaker or fuse or any manual act(s), including accidental opening of a switch controlling normal lighting facilities.

1006.2.3.3 Emergency generators providing power to emergency lighting systems shall be installed in accordance with NFPA 110. Stored electrical energy systems where required in this code shall be installed and tested in accordance with NFPA 111.

1006.2.3.4 Battery-operated emergency lights shall use only reliable types of rechargeable batteries provided with suitable facilities for maintaining them in a properly

charged condition. Batteries used in such lights or units shall be approved for their intended use and shall comply with Chapter 27 of the *Florida Building Code, Building*.

1006.2.3.5 The emergency lighting system shall be either continuously in operation or shall be capable of repeated automatic operation without manual intervention.

1006.2.4 Standby power. High-rise buildings shall be provided with Class 1, Type 60 standby power in accordance with Chapter 27 of the *Florida Building Code, Building* and NFPA 110. The standby power system shall have a capacity and rating sufficient to supply all required equipment. Selective load pickup and load shedding shall be permitted in accordance with Chapter 27 of the *Florida Building Code, Building*. The standby power system shall be connected to the following:

1. Emergency lighting system.
2. At least one elevator serving all floors and transferable to any elevator.
3. Mechanical equipment for smokeproof enclosures.

(See Section 403 for additional requirements for standby power in high-rise structures.)

1006.3 Exit signs.

1006.3.1 Exits shall be marked by an approved sign readily visible from any direction of exit access. Every exit sign shall be suitably illuminated by a reliable light source. Externally and internally illuminated signs shall be visible in both normal and emergency lighting.

Exception: Main exterior exit doors that obviously and clearly are identifiable as exits.

1006.3.2 New sign placement shall be such that no point in an exit access corridor is in excess of the rated viewing distance or 100 feet (30 m) whichever is less, from the nearest sign.

1006.3.3 Every required sign shall be located and of such size, distinctive color and design as to be readily visible and shall provide contrast with interior finish or other signs. No equipment that impairs visibility of an exit sign shall be permitted, nor shall there be any brightly illuminated sign or object in or near the line of vision of the required exit sign of such a character as to detract attention from the exit sign. Floor proximity signs, where required, shall be in accordance with Section 1006.3.8.2 or 1006.3.8.3.

1006.3.4 Exit stair door or tactile signage. Tactile signage stating "EXIT" and complying with ICC/ANSI A117.1, shall be installed adjacent to the latch side of the door 60 inches (1524 mm) above the finished floor to the center line of the sign.

1006.3.5 Externally illuminated signs shall have the word "EXIT" or other appropriate wording in plainly legible letters not less than 6 inches (152 mm) high with the principal strokes of letters not less than $\frac{3}{4}$ inches (19 mm) wide. The word "EXIT" shall have letters of a width not less than 2 inches (51 mm), except the letter "I," and the minimum spacing between letters shall be not less than $\frac{3}{8}$ inches (10

mm). Signs larger than the minimum established in this paragraph shall have letter widths, strokes and spacing in proportion to their height. Externally illuminated signs shall be illuminated by not less than 5 footcandles (50 lux) at the illuminated surface and shall have a contrast ratio of not less than 0.5.

Exceptions:

1. Marking required by Section 1009.5.3.
2. Group R-3 and Group R-4 (small facility) occupancies.

1006.3.6 Internally illuminated signs shall be listed in accordance with UL 924, *Standard for Safety Emergency Lighting Power Equipment*. The visibility of an internally illuminated sign shall be the equivalent of an externally illuminated sign that complies with Section 1006.3.5.

Exceptions:

1. Marking required by Section 1009.5.3.
2. Signs in compliance with Sections 1006.3.4 and 1006.3.8.2.

1006.3.7 Where emergency lighting facilities are required by Section 1006.2, the exit signs shall be illuminated by the emergency lighting facilities. The level of illumination of the exit sign shall be at the levels provided in accordance with Section 1006.3.5 for the required emergency lighting time duration as specified in Section 1006.2.3.1, but shall be permitted to decline to 60 percent of the illumination level at the end of the emergency lighting time duration.

1006.3.8 Where the direction of travel to reach the nearest exit is not apparent, a directional sign complying with Sections 1006.3.5 or 1006.3.6 reading “EXIT,” or a similar designation with a directional indicator showing the direction of travel shall be placed in every location. Directional signs shall be listed.

1006.3.8.1 The directional indicator shall be located outside of the “EXIT” legend, not less than $\frac{3}{8}$ inches (10 mm) from any letter. The directional indicator shall be of a chevron type and shall be identifiable as a directional indicator at a minimum distance of 40 feet (12.2 m). A directional indicator larger than the minimum established in this section shall be proportionately increased in height, width and stroke. The directional indicators shall be located at the end of the sign for the direction indicated.

1006.3.8.2 Where floor proximity exit signs are required, exit signs shall be placed near the floor level in addition to those signs required for doors or corridors. These signs shall be illuminated in accordance with Section 1006.3. Externally illuminated signs shall be sized in accordance with Section 1006.3.5. The bottom of the sign shall be at least 6 inches (152 mm) and no more than 8 inches (203 mm) above the floor. For exit doors, the sign shall be mounted on the door or adjacent to the door with the nearest edge of the sign within 4 inches (102 mm) of the door frame.

1006.3.8.3 Where floor proximity egress path marking is required, a listed and approved floor proximity egress

path marking system that is internally illuminated shall be installed within 18 inches (457 mm) of the floor. The system shall provide a visible delineation of the path of travel along the designated exit access and shall be essentially continuous, except as interrupted by doorways, hallways, corridors or other such architectural features. The system shall operate continuously or at any time the building fire alarm system is activated. The activation, duration and continuity of operation of the system shall be in accordance with Section 1006.2.

1006.3.9 Signs installed as projections from a wall or ceiling within the means of egress shall provide vertical clearance no less than 80 inches (2134 mm) from the walking surface.

1006.4 Performance of system. Reserved.

SECTION 1007 ACCESSIBLE MEANS OF EGRESS

1007.1 Accessible means of egress. Accessible means of egress shall be provided in accordance with Sections 11-4.1.3(8), 11-4.1.3(9) and 11-4.3(10).

1007.2 Continuity and components. Reserved.

1007.3 Exit stairways. Reserved.

1007.4 Elevators. Reserved.

1007.5 Platform lifts. Reserved.

1007.6 Areas of refuge. Reserved.

1007.7 Signage. Reserved.

1007.8 Exterior area for assisted rescue. Reserved.

SECTION 1008 DOORS, GATES AND TURNSTILES

1008.1 Doors. Means of egress doors shall meet the requirements of this section. Doors serving a means of egress system shall meet the requirements of this section and Section 1017.2. Doors provided for egress purposes in numbers greater than required by this code shall meet the requirements of this section. For accessibility provisions related to doors, refer to Sections 11-4.1.3, 11-4.3.9 and 11-4.13.

Means of egress doors shall be readily distinguishable from the adjacent construction and finishes such that the doors are easily recognizable as doors. Mirrors or similar reflecting materials shall not be used on means of egress doors. Means of egress doors shall not be concealed by curtains, drapes, decorations or similar materials.

1008.1.1 Size of doors. The minimum width of each door opening shall be sufficient for the occupant load thereof and shall provide a clear width of not less than 32 inches (813 mm). Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). Where this section requires a minimum clear width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 32 inches (813 mm). The maximum width of a swinging door leaf

shall be 48 inches (1219 mm) nominal. Means of egress doors in a Group I-2 occupancy used for the movement of beds shall provide a clear width not less than 41.5 inches (1054 mm). The height of doors shall not be less than 80 inches (2032 mm).

Exceptions:

1. The minimum and maximum width shall not apply to door openings that are not part of the required means of egress in Group R-2 and R-3 occupancies.
2. Door openings to resident sleeping units in Group I-3 occupancies shall have a clear width of not less than 28 inches (711 mm).
3. Door openings to storage closets less than 10 square feet (0.93 m²) in area shall not be limited by the minimum width.
4. Width of door leafs in revolving doors that comply with Section 1008.1.3.1 shall not be limited.
5. Door openings within a dwelling unit or sleeping unit shall not be less than 78 inches (1981 mm) in height.
6. Exterior door openings in dwelling units and sleeping units, other than the required exit door, shall not be less than 76 inches (1930 mm) in height.
7. In other than Group R-1 occupancies, the minimum widths shall not apply to interior egress doors within a dwelling unit or sleeping unit that is not required to be an Accessible unit, Type A unit or Type B unit.
8. Door openings required to be accessible within Type B units shall have a minimum clear width of 31.75 inches (806 mm).

1008.1.1.1 Projections into clear width. There shall not be projections into the required clear width lower than 34 inches (864 mm) above the floor or ground. Projections into the clear opening width between 34 inches (864 mm) and 80 inches (2032 mm) above the floor or ground shall not exceed 4 inches (102 mm).

1008.1.2 Door swing. Egress doors shall be side-hinged swinging.

Exceptions:

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single dwelling unit in Groups R-2 and R-3.
5. In other than Group H occupancies, revolving doors complying with Section 1008.1.3.1.

6. In other than Group H occupancies, horizontal sliding doors complying with Section 1008.1.3.3 are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.3.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.

Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons or a Group H occupancy.

The opening force for interior side-swinging doors without closers shall not exceed a 5-pound (22 N) force. For other side-swinging, sliding and folding doors, the door latch shall release when subjected to a 15-pound (67 N) force. The door shall be set in motion when subjected to a 30-pound (133 N) force. The door shall swing to a full-open position when subjected to a 15-pound (67 N) force. Forces shall be applied to the latch side.

1008.1.3 Special doors. Special doors and security grilles shall comply with the requirements of Sections 1008.1.3.1 through 1008.1.3.5.

1008.1.3.1 Revolving doors. Revolving doors shall comply with the following:

1. Each revolving door shall be capable of collapsing into a bookfold position with parallel egress paths providing an aggregate width of 36 inches (914 mm).
2. A revolving door shall not be located within 10 feet (3048 mm) of the foot of or top of stairs or escalators. A dispersal area shall be provided between the stairs or escalators and the revolving doors.
3. The revolutions per minute (rpm) for a revolving door shall not exceed those shown in Table 1008.1.3.1.
4. Each revolving door shall have a side-hinged swinging door which complies with Section 1008.1 in the same wall and within 10 feet (3048 mm) of the revolving door, unless one of the following conditions applies:
 - a. Revolving doors shall be permitted without adjacent swinging doors, as required by Section 1008.1.3.1(4) in street floor elevator lobbies, provided that no stairways or doors from other parts of the building discharge through the lobby and the lobby has no occupancy other than as means of travel between the elevators and the street.
 - b. The requirement of Section 1008.1.3.1(4) shall not apply to existing revolving doors where the number of revolving doors does not exceed the number of swinging doors within 240 inches (6100 mm) of the revolving doors.

TABLE 1008.1.3.1
REVOLVING DOOR SPEEDS

INSIDE DIAMETER (feet-inches)	POWER-DRIVEN-TYPE SPEED CONTROL (rpm)	MANUAL-TYPE SPEED CONTROL (rpm)
6-6	11	12
7-0	10	11
7-6	9	11
8-0	9	10
8-6	8	9
9-0	8	9
9-6	7	8
10-0	7	8

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

1008.1.3.1.1 Egress component. A revolving door used as a component of a means of egress shall comply with Section 1008.1.3.1 and the following three conditions:

1. Revolving doors shall not be given credit for more than 50 percent of the required egress capacity.
2. Each revolving door shall be credited with no more than a 50-person capacity.
3. Each revolving door shall be capable of being collapsed when a force of not more than 130 pounds (578 N) is applied within 3 inches (76 mm) of the outer edge of a wing.

1008.1.3.1.2 Other than egress component. A revolving door used as other than a component of a means of egress shall comply with Section 1008.1.3.1. The collapsing force of a revolving door not used as a component of a means of egress shall not be more than 180 pounds (801 N).

Exception: A collapsing force in excess of 180 pounds (801 N) is permitted if the collapsing force is reduced to not more than 130 pounds (578 N) when at least one of the following conditions is satisfied:

1. There is a power failure or power is removed to the device holding the door wings in position.
2. There is an actuation of the automatic sprinkler system where such system is provided.
3. There is an actuation of a smoke detection system which is installed in accordance with Section 907 to provide coverage in areas within the building which are within 75 feet (22 860 mm) of the revolving doors.
4. There is an actuation of a manual control switch, in an approved location and clearly defined, which reduces the holding force to below the 130-pound (578 N) force level.

1008.1.3.2 Power-operated doors. Where means of egress doors are operated by power, such as doors with a

photoelectric-actuated mechanism to open the door upon the approach of a person, or doors with power-assisted manual operation, the design shall be such that in the event of power failure, the door is capable of being opened manually to permit means of egress travel or closed where necessary to safeguard means of egress. The forces required to open these doors manually shall not exceed those specified in Section 1008.1.2, except that the force to set the door in motion shall not exceed 50 pounds (220 N). The door shall be capable of swinging from any position to the full width of the opening in which such door is installed when a force is applied to the door on the side from which egress is made. Full-power-operated doors shall comply with BHMA A156.10. Power-assisted and low-energy doors shall comply with BHMA A156.19. On the egress side of each door, there shall be a readily visible, durable sign that reads: "IN EMERGENCY PUSH TO OPEN."

The sign shall be in letters not less than 1 inch (25 mm) high on a contrasting background.

Exceptions:

1. Occupancies in Group I-3.
2. Horizontal sliding doors complying with Section 1008.1.3.3.
3. Sliding, power-operated doors in exit access serving an occupant load of fewer than 50 that manually opens in the direction of door travel with forces not more than required in Section 1008 shall not be required to have a swing-out feature. The required sign shall state, "IN EMERGENCY, SLIDE TO OPEN."
4. In the emergency breakout mode, a door leaf located within a two-leaf opening shall be exempt from the minimum 32-inch (813 mm) single-leaf requirement, provided the clear width of the single leaf is at least 30 inches (762 mm).
5. For a biparting door in the emergency breakout mode, a door leaf located within a multiple-leaf opening shall be exempt from the minimum 32-inch (813 mm) single-leaf requirement of Section 1008.1.1, provided a minimum 32-inch (813 mm) clear opening is provided when the two biparting leaves meeting in the center are broken out.

1008.1.3.3 Horizontal sliding doors. In other than Group H occupancies, horizontal sliding doors permitted to be a component of a means of egress in accordance with Exception 6 to Section 1008.1.2 shall comply with all of the following criteria:

1. The doors shall be power operated and shall be capable of being operated manually in the event of power failure.
2. The doors shall be openable by a simple method from both sides without special knowledge or effort.

3. The force required to operate the door shall not exceed 30 pounds (133 N) to set the door in motion and 15 pounds (67 N) to close the door or open it to the minimum required width.
4. The door shall be openable with a force not to exceed 15 pounds (67 N) when a force of 250 pounds (1100 N) is applied perpendicular to the door adjacent to the operating device.
5. The door assembly shall comply with the applicable fire protection rating and, where rated, shall be self-closing or automatic-closing by smoke detection, shall be installed in accordance with NFPA 80 and shall comply with Section 715.
6. The door assembly shall have an integrated standby power supply.
7. The door assembly power supply shall be electrically supervised.
8. The door shall open to the minimum required width within 10 seconds after activation of the operating device.
9. In apartment buildings, hotels and dormitories, horizontal sliding doors shall not be used across corridors.

1008.1.3.4 Access-controlled egress doors. The entrance doors in a means of egress in buildings with an occupancy in Group A, B, D, E, M, R-1 or R-2 and entrance doors to tenant spaces in occupancies in Groups A, B, D, E, M, R-1 and R-2 are permitted to be equipped with an approved entrance and egress access control system which shall be installed in accordance with all of the following criteria:

1. A sensor shall be provided on the egress side arranged to detect an occupant approaching the doors. The doors shall be arranged to unlock by a signal from or loss of power to the sensor.
2. Loss of power to that part of the access control system which locks the doors shall automatically unlock the doors.
3. The doors shall be arranged to unlock from a manual unlocking device located 40 inches to 48 inches (1016 mm to 1219 mm) vertically above the floor and within 5 feet (1524 mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads "PUSH TO EXIT." When operated, the manual unlocking device shall result in direct interruption of power to the lock—*independent of the access control system electronics*—and the doors shall remain unlocked for a minimum of 30 seconds.
4. Activation of the building fire alarm system, if provided, shall automatically unlock the doors, and the doors shall remain unlocked until the fire alarm system has been reset.
5. Activation of the building automatic sprinkler or fire detection system, if provided, shall automati-

cally unlock the doors. The doors shall remain unlocked until the fire alarm system has been reset.

6. Entrance doors in buildings with an occupancy in Group A, B, E or M shall not be secured from the egress side during periods that the building is open to the general public.

1008.1.3.5 Security grilles. In Groups B, F, M, R and S, horizontal sliding or vertical security grilles are permitted at the main exit and shall be openable from the inside without the use of a key or special knowledge or effort during periods that the space is occupied. The grilles shall remain secured in the full-open position during the period of occupancy by the general public. Where two or more means of egress are required, not more than one-half of the exits or exit access doorways shall be equipped with horizontal sliding or vertical security grilles.

1008.1.3.6 The temporary installation or closure of storm shutters, panels and other approved hurricane protection devices shall be permitted on emergency escape and rescue openings in Group R occupancies during the threat of a storm. Such devices shall not be required to comply with the operational constraints of Section 1026.4. While such protection is provided, at least one means of escape from the dwelling or dwelling unit shall be provided. The means of escape shall be within the first floor of the dwelling or dwelling unit and shall not be located within a garage without a side hinged door leading directly to the exterior. Occupants in any part of the dwelling or dwelling unit shall be able to access the means of escape without passing through a lockable door not under their control.

1008.1.3.7 Self-closing doors. Where doors are required to be self-closing and are operated by power upon the approach of a person or are provided with power-assisted manual operation, they shall be permitted in the means of egress in accordance with the following:

1. Doors can be opened manually in accordance with Section 1008.1.3.2 to allow egress travel in the event of power failure.
2. The doors remain in the closed position unless actuated or opened manually.
3. When actuated, doors remain open for not more than 30 seconds.
4. Doors held open for any period of time close and the power-assist mechanism ceases to function upon operation of approved smoke detectors installed in such a way as to detect smoke on either side of the door opening in accordance with the provisions of NFPA 72.
5. Doors required to be self-latching are either self-latching or become self-latching upon operation of approved smoke detectors in accordance with Section 1008.1.3.7(4).
6. Power-assisted swinging doors shall comply with ANSI/BHMA A156.19.

1008.1.4 Floor elevation. There shall be a floor or landing on each side of a door. Such floor or landing shall be at the same elevation on each side of the door. Landings shall be level except for exterior landings, which are permitted to have a slope not to exceed one unit vertical in 50 units horizontal (2-percent slope).

Exceptions:

1. Doors serving individual dwelling units in Groups R-2 and R-3 where the following apply:
 - 1.1. A door is permitted to open at the top step of an interior flight of stairs, provided the door does not swing over the top step.
 - 1.2. Screen doors and storm doors are permitted to swing over stairs or landings.
2. Exterior doors as provided for in Section 1003.5, Exception 1, and Section 1018.2, which are not on an accessible route.
3. In Group R-3 occupancies not required to be Accessible units, Type A units or Type B units, the landing at an exterior doorway shall not be more than 7.75 inches (197 mm) below the top of the threshold, provided the door, other than an exterior storm or screen door, does not swing over the landing.
4. Variations in elevation due to differences in finish materials, but not more than 0.5 inch (12.7 mm).
5. Exterior decks, patios or balconies that are part of Type B dwelling units, have impervious surfaces and that are not more than 4 inches (102 mm) below the finished floor level of the adjacent interior space of the dwelling unit.

1008.1.5 Landings at doors. Landings shall have a width not less than the width of the stairway or the door, whichever is greater. Doors in the fully open position shall not reduce a required dimension by more than 7 inches (178 mm). When a landing serves an occupant load of 50 or more, doors in any position shall not reduce the landing to less than one-half its required width. Landings shall have a length measured in the direction of travel of not less than 44 inches (1118 mm).

Exception: Landing length in the direction of travel in Groups R-3 and U and within individual units of Group R-2 need not exceed 36 inches (914 mm).

1008.1.6 Thresholds. Thresholds at doorways shall not exceed 0.75 inch (19.1 mm) in height for sliding doors serving dwelling units or 0.5 inch (12.7 mm) for other doors. Raised thresholds and floor level changes greater than 0.25 inch (6.4 mm) at doorways shall be beveled with a slope not greater than one unit vertical in two units horizontal (50-percent slope).

Exceptions:

1. The threshold height shall be limited to 7³/₄ inches (197 mm) where the occupancy is Group R-2, the door is an exterior door that is not a component of the required means of egress and the doorway is

not on an accessible route. In one- and two-family dwellings where the door discharges to the outside or to an exterior balcony or exterior exit access, the floor level outside the door shall be permitted to be one step lower than the inside, but not more than 8 inches (203 mm) lower.

2. For exterior doors serving dwelling units, thresholds at doorways shall not exceed the height required to pass the water resistance test of ANSI/AAMA/WDMA 101/I.S.2, or TAS 202 for high-velocity hurricane zones, or the maximum allowable height difference between interior floor level. Exterior floor level shall comply with the following:

LEVEL DIFFERENCE (inches)	AT PRIMARY DOOR
0	Pervious construction (e.g., wood decking with spaces)
1/2	Impervious construction (e.g., concrete, brick or flag stone)
LEVEL DIFFERENCE (inches)	AT SECONDARY DOOR
1/2	Pervious construction
4	Impervious construction

For SI: 1 inch = 25.4 mm.

1008.1.7 Door arrangement. Space between two doors in a series shall be 48 inches (1219 mm) minimum plus the width of a door swinging into the space. Doors in a series shall swing either in the same direction or away from the space between the doors.

Exceptions:

1. The minimum distance between horizontal sliding power-operated doors in a series shall be 48 inches (1219 mm).
2. Storm and screen doors serving individual dwelling units in Groups R-2 and R-3 need not be spaced 48 inches (1219 mm) from the other door.
3. Doors within individual dwelling units in Groups R-2 and R-3 other than within Type A dwelling units.

1008.1.8 Door operations. Except as specifically permitted by this section egress doors shall be readily openable from the egress side without the use of a key or special knowledge or effort.

1008.1.8.1 Hardware. Door handles, pulls, latches, locks and other operating devices on doors required to be accessible by Chapter 11 shall not require tight grasping, tight pinching or twisting of the wrist to operate.

1008.1.8.2 Hardware height. A latch or other fastening device on a door shall be provided with a releasing device having an obvious method of operation under all lighting conditions. The releasing mechanism for any latch shall be located at least 34 inches (864 mm) and not more than 48 inches (1219 mm) above the finished floor.

Doors shall be openable with not more than one releasing operation.

Exception: Egress doors from individual living units and guest rooms of residential occupancies shall be permitted to be provided with devices that require not more than one additional releasing operation if such device is operable from the inside without the use of a key or tool and is mounted at a height not more than 48 inches (1219 mm) above the finished floor.

1008.1.8.3 Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint.
2. In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M and S, and in places of religious worship, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
 - 2.1. The locking device is readily distinguishable as locked,
 - 2.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background,
 - 2.3. The use of the key-operated locking device is revokable by the building official for due cause.
3. Where egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.
4. Doors from individual dwelling or sleeping units of Group R occupancies having an occupant load of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.

1008.1.8.4 Bolt locks. Manually operated flush bolts or surface bolts are not permitted. All hardware must be direct acting requiring no more than one operation. Double cylinder dead bolts, requiring a key for operation on both sides, are prohibited on required means of egress doors unless the locking device is provided with a key which cannot be removed when the door is locked from the inside. Only one locking or latching device shall be permitted on a door or on one leaf of a pair of doors.

Exceptions:

1. On doors not required for egress in individual dwelling units or sleeping units.

2. Where a pair of doors serves a storage or equipment room, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf.

1008.1.8.5 Unlatching. The unlatching of any door or leaf shall not require more than one operation.

Exceptions:

1. Places of detention or restraint.
2. Where manually operated bolt locks are permitted by Section 1008.1.8.4.
3. Doors with automatic flush bolts as permitted by Section 1008.1.8.3, Exception 3.
4. Doors from individual dwelling units and sleeping units of Group R occupancies as permitted by Section 1008.1.8.3, Exception 4.

1008.1.8.6 Delayed egress locks. Approved, listed, delayed egress locks shall be permitted to be installed on doors serving any occupancy except Group A, E and H occupancies in buildings that are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors unlock in accordance with Items 1 through 6 below. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an exit.

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a signal from the fire command center.
4. The initiation of an irreversible process which will release the latch in not more than 15 seconds when a force of not more than 15 pounds (67 N) is applied for 1 second to the release device. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the door lock has been released by the application of force to the releasing device, relocking shall be by manual means only.

Exception: Where approved, a delay of not more than 30 seconds is permitted.

5. A sign shall be provided on the door located above and within 12 inches (305 mm) of the release device reading: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS.
6. Emergency lighting shall be provided at the door.

1008.1.8.7 Stairway doors. Interior stairway means of egress doors shall be openable from both sides without the use of a key or special knowledge or effort.

Exceptions:

1. Stairway discharge doors shall be openable from the egress side and shall only be locked from the opposite side.
2. This section shall not apply to doors arranged in accordance with Section 403.12.
3. In stairways serving not more than four stories, doors are permitted to be locked from the side opposite the egress side, provided they are openable from the egress side and capable of being unlocked simultaneously without unlatching upon a signal from the fire command center, if present, or a signal by emergency personnel from a single location inside the main entrance to the building.

1008.1.8.8 During its swing, any door in a means of egress shall leave unobstructed at least one half of the required width of an aisle, corridor, passageway or landing, nor project more than 7 inches (178 mm) into the required width of an aisle, corridor, passageway or landing, when fully open. Doors shall not open immediately onto a stair without a landing. The landing shall have a width at least equal to the width of the door. See Section 1027 for door swing in Group E occupancies.

Every door in a stair enclosure serving more than four stories shall permit reentry from the stair enclosure to the interior of the building, or an automatic release shall be provided to unlock all stair enclosure doors to permit reentry. Such automatic release shall be actuated with the initiation of the building fire alarm, fire detection or fire sprinkler system.

Exception: Doors on stair enclosures shall be permitted to be equipped with hardware that prevents reentry into the interior of the building, provided that the following conditions are met:

1. There are at least two levels where it is possible to leave the stair enclosure;
2. There are not more than four stories intervening between stories where it is possible to leave the stair enclosure;
3. Reentry is possible on the top or next to top story permitting access to another exit;
4. Doors permitting reentry are identified as such on the stair side of the door; and
5. Doors not permitting reentry are provided with a sign on the stair side indicating the location of the nearest door, in each direction of travel, permitting reentry or exit.

1008.1.9 Panic and fire exit hardware. Where panic and fire exit hardware is installed, it shall comply with the following:

1. The actuating portion of the releasing device shall extend at least one-half of the door leaf width.
2. The maximum unlatching force shall not exceed 15 pounds (67 N).

Each door in a means of egress from a Group A or E occupancy having an occupant load of 50 or more and any Group H occupancy shall not be provided with a latch or lock unless it is panic hardware or fire exit hardware.

Exception: A main exit of a Group A occupancy in compliance with Section 1008.1.8.3, Item 2.

Electrical rooms with equipment rated 1,200 amperes or more and over 6 feet (1829 mm) wide that contain overcurrent devices, switching devices or control devices with exit access doors must be equipped with panic hardware and doors must swing in the direction of egress.

If balanced doors are used and panic hardware is required, the panic hardware shall be the push-pad type and the pad shall not extend more than one-half the width of the door measured from the latch side.

1008.2 Gates. Gates serving the means of egress system shall comply with the requirements of this section. Gates used as a component in a means of egress shall conform to the applicable requirements for doors.

Exception: Horizontal sliding or swinging gates exceeding the 4-foot (1219 mm) maximum leaf width limitation are permitted in fences and walls surrounding a stadium.

1008.2.1 Stadiums. Panic hardware is not required on gates surrounding stadiums where such gates are under constant immediate supervision while the public is present, and where safe dispersal areas based on 3 square feet (0.28 m²) per occupant are located between the fence and enclosed space. Such required safe dispersal areas shall not be located less than 50 feet (15 240 mm) from the enclosed space. See Section 1024.6 for means of egress from safe dispersal areas.

1008.3 Turnstiles. Turnstiles or similar devices that restrict travel to one direction shall not be placed so as to obstruct any required means of egress.

Exception: Each turnstile or similar device shall be credited with no more than a 50-person capacity where all of the following provisions are met:

1. Each device shall turn free in the direction of egress travel when primary power is lost, and upon the manual release by an employee in the area.
2. Such devices are not given credit for more than 50 percent of the required egress capacity.
3. Each device is not more than 39 inches (991 mm) high.
4. Each device has at least 16.5 inches (419 mm) clear width at and below a height of 39 inches (991 mm) and at least 22 inches (559 mm) clear width at heights above 39 inches (991 mm).

Where located as part of an accessible route, turnstiles shall have at least 36 inches (914 mm) clear at and below a height of 34 inches (864 mm), at least 32 inches (813 mm) clear width between 34 inches (864 mm) and 80 inches (2032 mm) and shall consist of a mechanism other than a revolving device.

1008.3.1 High turnstile. Turnstiles more than 39 inches (991 mm) high shall meet the requirements for revolving doors.

1008.3.2 Additional door. Where serving an occupant load greater than 300, each turnstile that is not portable shall have a side-hinged swinging door which conforms to Section 1008.1 within 50 feet (15 240 mm).

SECTION 1009 STAIRWAYS

1009.1 Stairway width. The width of stairways shall be determined as specified in Section 1005.1, but such width shall not be less than 44 inches (1118 mm). See Section 1007.1 for accessible means of egress stairways.

Exceptions:

1. Stairways serving an occupant load of less than 50 shall have a width of not less than 36 inches (914 mm).
2. Spiral stairways as provided for in Section 1009.8.
3. Aisle stairs complying with Section 1025.
4. Where an incline platform lift or stairway chairlift is installed on stairways serving occupancies in Group R-3, or within dwelling units in occupancies in Group R-2, a clear passage width not less than 20 inches (508 mm) shall be provided. If the seat and platform can be folded when not in use, the distance shall be measured from the folded position.

1009.2 Headroom. Stairways shall have a minimum headroom clearance of 80 inches (2032 mm) measured vertically from a line connecting the edge of the nosings. Such headroom shall be continuous above the stairway to the point where the line intersects the landing below, one tread depth beyond the bottom riser. The minimum clearance shall be maintained the full width of the stairway and landing.

Exception: Spiral stairways complying with Section 1009.8 are permitted a 78-inch (1981 mm) headroom clearance.

1009.3 Stair treads and risers. Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. Stair tread depths shall be 11 inches (279 mm) minimum. The riser height shall be measured vertically between the leading edges of adjacent treads. The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. Winder treads shall have a minimum tread depth of 11 inches (279 mm) measured at a right angle to the tread's leading edge at a point 12 inches (305 mm) from the side where the treads are narrower and a minimum tread depth of 10 inches (254 mm).

Exceptions:

1. Alternating tread devices in accordance with Section 1009.9.
2. Spiral stairways in accordance with Section 1009.8.

3. Aisle stairs in assembly seating areas where the stair pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area in accordance with Section 1025.11.2.
4. In occupancies in Group R-3, as applicable in Section 101.2, within dwelling units in occupancies in Group R-2, as applicable in Section 101.2, and in occupancies in Group U, which are accessory to an occupancy in Group R-3, as applicable in Section 101.2, the maximum riser height shall be 7.75 inches (197 mm) and the minimum tread depth, exclusive of nosing, shall be not less than 9 inches (229 mm), the minimum winder tread depth at the walk line shall be 10 inches (254 mm), and the minimum winder tread depth shall be 6 inches (152 mm). Treads and risers of stairs shall be permitted to be so proportioned that the sum of two risers and a tread, exclusive of projection of nosing, is not less than 24 inches (610 mm) nor more than 25 inches (635 mm). Every tread less than 10 inches (254 mm) wide shall have a nosing, or effective projection, of approximately 1 inch (25 mm) over the level immediately below that tread.
5. See the *Florida Building Code, Existing Building* for the replacement of existing stairways.
6. Industrial equipment access stairs and landings that serve as a component of the means of egress from the involved equipment and do not serve more than 20 people shall be permitted to have a minimum clear width of 22 inches (559 mm), minimum tread depth of 10 inches (254 mm), maximum riser height of 9 inches (229 mm), minimum headroom of 6 feet 8 inches (2032 mm), and a maximum height between landings of 12 feet (36 576 mm).

1009.3.1 Winder treads. Winder treads are not permitted in means of egress stairways except within a dwelling unit.

Exceptions:

1. Curved stairways in accordance with Section 1009.7.
2. Spiral stairways in accordance with Section 1009.8.

1009.3.2 Dimensional uniformity. Stair treads and risers shall be of uniform size and shape. The tolerance between the largest and smallest riser height or between the largest and smallest tread depth shall not exceed 0.375 inch (9.5 mm) in any flight of stairs. The greatest winder tread depth at the 12-inch (305 mm) walk line within any flight of stairs shall not exceed the smallest by more than 0.375 inch (9.5 mm) measured at a right angle to the tread's leading edge.

Exceptions:

1. Nonuniform riser dimensions of aisle stairs complying with Section 1025.11.2.
2. Consistently shaped winders, complying with Section 1009.3, differing from rectangular treads in the same stairway flight.

Where the bottom or top riser adjoins a sloping public way, walkway or driveway having an established grade and

serving as a landing, the bottom or top riser is permitted to be reduced along the slope to less than 4 inches (102 mm) in height, with the variation in height of the bottom or top riser not to exceed one unit vertical in 12 units horizontal (8.333-percent slope) of stairway width. The nosings or leading edges of treads at such nonuniform height risers shall have a distinctive marking stripe, different from any other nosing marking provided on the stair flight. The distinctive marking stripe shall be visible in descent of the stair and shall have a slip-resistant surface. Marking stripes shall have a width of at least 1 inch (25 mm) but not more than 2 inches (51 mm).

1009.3.3 Profile. The radius of curvature at the leading edge of the tread shall be not greater than 0.5 inch (12.7 mm). Beveling of nosings shall not exceed 0.5 inch (12.7 mm). Risers shall be solid and vertical or sloped from the underside of the leading edge of the tread above at an angle not more than 30 degrees (0.52 rad) from the vertical. The leading edge (nosings) of treads shall project not more than 1.25 inches (32 mm) beyond the tread below and all projections of the leading edges shall be of uniform size, including the leading edge of the floor at the top of a flight.

Exceptions:

1. Solid risers are not required for stairways that are not required to comply with Section 1007.3, provided that the opening between treads does not permit the passage of a sphere with a diameter of 4 inches (102 mm).
2. Solid risers are not required for occupancies in Group I-3.

1009.3.4 Tread slope shall not be more than $\frac{1}{4}$ inch per foot (21 mm/m).

1009.4 Stairway landings. There shall be a floor or landing at the top and bottom of each stairway. The width of landings shall not be less than the width of stairways they serve. Every landing shall have a minimum dimension measured in the direction of travel equal to the width of the stairway. Such dimension need not exceed 48 inches (1219 mm) where the stairway has a straight run.

Exceptions:

1. Aisle stairs complying with Section 1024.
2. Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches (178 mm) into a landing.
3. In one- and two-family dwellings, a door at the top of a stair shall be permitted to open directly at a stair, provided the door does not swing over the stair and the door serves an area with an occupant load of fewer than 50 persons.

1009.5 Stairway construction. All stairways shall be built of materials consistent with the types permitted for the type of construction of the building, except that wood handrails shall be permitted for all types of construction.

1009.5.1 Stairway walking surface. The walking surface of treads and landings of a stairway shall not be sloped

steeper than one unit vertical in 50 units horizontal (2-percent slope) in any direction. Stairway treads and landings shall have a solid surface. Finish floor surfaces shall be securely attached.

Exception: In Group F, H and S occupancies, other than areas of parking structures accessible to the public, openings in treads and landings shall not be prohibited provided a sphere with a diameter of 1.125 inches (29 mm) cannot pass through the opening.

1009.5.2 Outdoor conditions. Outdoor stairways and outdoor approaches to stairways shall be designed so that water will not accumulate on walking surfaces.

1009.5.3 Enclosures under stairways. The walls and soffits within enclosed usable spaces under enclosed and unenclosed stairways shall be protected by 1-hour fire-resistance-rated construction or the fire-resistance rating of the stairway enclosure, whichever is greater. Access to the enclosed space shall not be directly from within the stair enclosure.

Exception: Spaces under stairways serving and contained within a single residential dwelling unit in Group R-2 or R-3 shall be permitted to be protected on the enclosed side with 0.5-inch (12.7 mm) gypsum board.

There shall be no enclosed usable space under exterior exit stairways unless the space is completely enclosed in 1-hour fire-resistance-rated construction. The open space under exterior stairways shall not be used for any purpose.

1009.5.4 Stair identification. An approved sign shall be located at each floor level landing in all enclosed stairways of buildings four or more stories in height. The sign shall indicate the floor level and the availability of roof access from that stairway and an identification of the stairway. The sign shall also state the floor level of and direction to exit discharge. The sign shall be located approximately 5 feet (1524 mm) above the floor landing in a position which is readily visible when the door is in the open or closed position. The floor level designation shall also be tactile in accordance with Chapter 11.

1009.6 Vertical rise. A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings.

Exception: Aisle stairs complying with Section 1025.

1009.7 Curved stairways. Curved stairways with winder treads shall have treads and risers in accordance with Section 1009.3 and the smallest radius shall not be less than twice the required width of the stairway.

Exceptions:

1. The radius restriction shall not apply to curved stairways for occupancies in Group R-3 and within individual dwelling units in occupancies in Group R-2.
2. In Group R-3 occupancies, circular stairs may have a minimum tread depth of 9 inches (229 mm) with 1 inch (25.4 mm) of nosing, and the smaller radius may be less than twice the width of the stairway.

1009.8 Spiral stairways. Where permitted by this section or in specific occupancies in accordance with Sections 1024 and 1026 through 1033, spiral stairs complying with this section shall be permitted as a component in a means of egress.

1009.8.1 Spiral stairs complying with the following shall be permitted:

1. Riser heights shall not exceed 7 inches (178 mm).
2. The stairway shall have a tread depth of not less than 11 inches (279 mm) for a portion of the stairway width sufficient to provide the egress capacity for the occupant load served in accordance with Section 1004.1.
3. At the outer side of the stairway, an additional 10 $\frac{1}{2}$ inches (267 mm) of width shall be provided clear to the other handrail, and this width shall not be included as part of the required egress capacity.
4. Handrails complying with Section 1009.11 shall be provided on both sides of the spiral stairway.
5. The inner handrail shall be located within 24 inches (610 mm), measured horizontally, of the point where a tread depth not less than 11 inches (279 mm) is provided.
6. The turn of the stairway shall be such that descending users have the outer handrail at their right side.

1009.8.2 Where the occupant load served does not exceed three and from mezzanines not exceeding 250 square feet (23 m²) and an occupant load of three or less, spiral stairs meeting the following conditions shall be permitted:

1. The clear width of the stairs shall be not less than 26 inches (660 mm).
2. The height of the risers shall not exceed 9 $\frac{1}{2}$ inches (241 mm).
3. Headroom shall be not less than 6 feet 6 inches (1981 mm).
4. Treads shall have a depth not less than 7 $\frac{1}{2}$ inches (191 mm) at a point 12 inches (305 mm) from the narrower edge.
5. All treads shall be identical.
6. Handrails complying with Section 1009.11 shall be provided on both sides of the spiral stairway.

1009.8.3 Within dwellings and dwelling units, guest rooms and guest suites where the occupant load served does not exceed five, spiral stairs meeting the following conditions shall be permitted:

1. The minimum stairway width shall be 26 inches (660 mm).
2. The height of risers shall not be more than 9 $\frac{1}{2}$ inches (241 mm).
3. The headroom shall be a minimum of 6 feet 6 inches (1981 mm).
4. Treads shall have a depth not less than 7 $\frac{1}{2}$ inches (190 mm) at a point 12 inches (305 mm) from the narrow edge.

5. All treads shall be identical.

6. Handrails shall be provided on one side.

1009.9 Alternating tread devices. Alternating tread devices are limited to an element of a means of egress in buildings of Groups F, H and S from a mezzanine not more than 250 square feet (23 m²) in area and which serves not more than three occupants; in buildings of Group I-3 from a guard tower, observation station or control room not more than 250 square feet (23 m²) in area and for access to unoccupied roofs.

1009.9.1 Handrails of alternating tread devices. Handrails shall be provided on both sides of alternating tread devices and shall comply with Section 1012.

1009.9.2 Treads of alternating tread devices. Alternating tread devices shall have a minimum projected tread of 5 inches (127 mm), a minimum tread depth of 8.5 inches (216 mm), a minimum tread width of 7 inches (178 mm) and a maximum riser height of 9.5 inches (241 mm). The initial tread of the device shall begin at the same elevation as the platform, landing or floor surface.

Exception: Alternating tread devices used as an element of a means of egress in buildings from a mezzanine area not more than 250 square feet (23 m²) in area which serves not more than five occupants shall have a minimum projected tread of 8.5 inches (216 mm) with a minimum tread depth of 10.5 inches (267 mm). The rise to the next alternating tread surface should not be more than 8 inches (203 mm).

1009.10 Handrails. Stairways shall have handrails on each side and shall comply with Section 1012. Where glass is used to provide the handrail, the handrail shall also comply with Section 2407.

Exceptions:

1. Aisle stairs complying with Section 1025 provided with a center handrail need not have additional handrails.
2. Stairways within dwelling units, spiral stairways and aisle stairs serving seating only on one side are permitted to have a handrail on one side only.
3. Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.
4. In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require handrails.
5. In one- and two-family dwellings and within dwelling units in Group R-2 occupancies, stairways having four or more risers above a floor or finished ground level shall be equipped with handrails located not less than 34 inches (864 mm) or more than 38 inches (965 mm) above the leading edge of a tread.

1009.11 Access to roof. Buildings four stories or more in height, except those with a roof slope greater than 4:12, shall be provided with a stairway to the roof. Such stairway shall be marked at street and floor levels with a sign indicating that it

continues to the roof. Where roofs are used for roof gardens or for other purposes, stairways shall be provided as required for such use or occupancy.

1009.11.1 Roof access. Reserved.

1009.12 Interlocking or scissor stairs shall comply with Sections 1009.12.1 and 1009.12.2.

1009.12.1 New interlocking or scissor stairs shall be permitted to be considered only as a single exit.

1009.12.2 Existing interlocking or scissor stairs shall be permitted to be considered separate exits if they meet the following criteria:

1. They are enclosed in accordance with Section 1019.
2. They are separated from each other by 2-hour fire-resistance-rated noncombustible construction.
3. No protected or unprotected penetrations or communicating openings exist between the stair enclosures.

1009.13 Accessible stairs. Stairs required to be accessible by Section 11-4.1 shall comply with Section 11-4.9. Floor surfaces of stairs along accessible routes and in accessible rooms and spaces shall comply with Section 11-4.5.

SECTION 1010 RAMPS

1010.1 Scope. The provisions of this section shall apply to ramps used as a component of a means of egress.

Exceptions:

1. Other than ramps that are part of the accessible routes providing access in accordance with Sections 11-4.7 through 11-4.8, ramped aisles within assembly rooms or spaces shall conform with the provisions in Section 1025.11.
2. Curb ramps shall comply with ICC A117.1.
3. Vehicle ramps in parking garages for pedestrian exit access shall not be required to comply with Sections 11-4.7 through 11.4-8 when they are not an accessible route serving accessible parking spaces, other required accessible elements or part of an accessible means of egress.

1010.2 Slope. Ramps used as part of a means of egress shall have a running slope not steeper than one unit vertical in 12 units horizontal (8.333-percent slope). The slope of other ramps shall not be steeper than one unit vertical in eight units horizontal (12.5-percent slope).

Exceptions:

1. Aisle ramp slope in occupancies of Group A shall comply with Section 1024.11.
2. Ramps that provide access to vehicles, vessels, mobile structures and aircraft shall not be required to comply with the maximum slope or maximum rise for a single ramp run.

1010.3 Cross slope. The slope measured perpendicular to the direction of travel of a ramp shall not be steeper than one unit vertical in 50 units horizontal (2-percent slope).

1010.4 Vertical rise. The rise for any ramp run shall be 30 inches (762 mm) maximum.

1010.5 Minimum dimensions. The minimum dimensions of means of egress ramps shall comply with Sections 1010.5.1 through 1010.5.3.

1010.5.1 Width. The minimum width of a means of egress ramp shall not be less than that required for corridors by Section 1017.2. The clear width of a ramp and the clear width between handrails, if provided, shall be 36 inches (914 mm) minimum.

Exception: Ramps that are part of a required means of egress shall not be less than 44 inches (1118 mm) wide.

1010.5.2 Headroom. The minimum headroom in all parts of the means of egress ramp shall not be less than 80 inches (2032 mm).

1010.5.3 Restrictions. Means of egress ramps shall not reduce in width in the direction of egress travel. Projections into the required ramp and landing width are prohibited. Doors opening onto a landing shall not reduce the clear width to less than 42 inches (1067 mm).

1010.6 Landings. Ramps shall have landings at the bottom and top of each ramp, points of turning, entrance, exits, at doors and in accordance with Section 11- 4.8.4. Landings shall comply with Sections 1010.6.1 through 1010.6.5.

1010.6.1 Slope. Landings shall have a slope not steeper than one unit vertical in 50 units horizontal (2-percent slope) in any direction. Changes in level are not permitted.

1010.6.2 Width. The landing shall be at least as wide as the widest ramp run adjoining the landing.

1010.6.3 Length. The landing length shall be 60 inches (1525 mm) minimum.

Exceptions:

1. Landings in nonaccessible Group R-2 and R-3 individual dwelling units are permitted to be 36 inches (914 mm) minimum.
2. Where the ramp is not a part of an accessible route, the length of the landing shall not be required to be more than 48 inches (1220 mm) in the direction of travel.
3. Accessible landings shall comply with Section 11-4.8.4.

1010.6.4 Change in direction. Where changes in direction of travel occur at landings provided between ramp runs, the landing shall be 60 inches by 60 inches (1524 mm by 1524 mm) minimum.

Exception: Landings in nonaccessible Group R-2 and R-3 individual dwelling units are permitted to be 36 inches by 36 inches (914 mm by 914 mm) minimum.

1010.6.5 Doorways. Where doorways are located adjacent to a ramp landing, maneuvering clearances required by ICC A117.1 are permitted to overlap the required landing area.

1010.7 Ramp construction. All ramps shall be built of materials consistent with the types permitted for the type of construction of the building, except that wood handrails shall be

permitted for all types of construction. Ramps used as an exit shall conform to the applicable requirements of Sections 1020.1 through 1020.1.3 for exit enclosures.

1010.7.1 Ramp surface. The surface of ramps shall be of slip-resistant materials that are securely attached.

1010.7.2 Outdoor conditions. Outdoor ramps and outdoor approaches to ramps shall be designed so that water will not accumulate on walking surfaces.

1010.7.3 All ramps that serve as required means of egress shall be of permanent, fixed construction.

1010.7.4 The ramp floor and landings shall be solid and without perforations.

1010.8 Handrails. Handrails shall be provided along both sides of a ramp run with a rise greater than 6 inches (152 mm) and shall conform to the requirements in Section 1009.11. If handrails are not continuous, they shall extend at least 18 inches (305 mm) beyond the top and bottom of the ramp segment and shall be parallel with the floor or ground surface. Ends of handrails shall be either rounded or returned smoothly to floor, wall or post. Handrails shall not rotate within their fittings. Top of the handrail gripping surface shall be not less than 34 inches (864 mm) nor more than 38 inches (965 mm) above the ramp surface.

Exceptions:

1. Handrails are not required when the total ramp run rise is 6 inches (152 mm) or less and the horizontal projection is 72 inches or less, except where required to be accessible.
2. Aisles in Group A occupancies (see Section 1024).
3. In dwelling units not required to be accessible by Chapter 11, handrails are not required to extend beyond the top and bottom of the ramp segment.
4. Handrails are not required on curb ramps.

1010.9 Edge protection. Edge protection complying with Section 1010.9.1 or 1010.9.2 shall be provided on each side of ramp runs and at each side of ramp landings.

Exceptions:

1. Edge protection is not required on ramps that are not required to have handrails, provided they have flared sides that comply with Section 11-4.8.7, curb ramp.
2. Edge protection is not required on the sides of ramp landings serving an adjoining ramp run or stairway.
3. Edge protection is not required on the sides of ramp landings having a vertical dropoff of not more than 0.5 inch (12.7 mm) within 10 inches (254 mm) horizontally of the required landing area.

1010.9.1 Curb, rail, wall or barrier. A curb, rail, wall or barrier shall be provided that prevents the passage of a 4-inch-diameter (102 mm) sphere, where any portion of the sphere is within 4 inches (102 mm) of the floor or ground surface.

1010.9.2 Extended floor or ground surface. The floor or ground surface of the ramp run or landing shall extend 12

inches (305 mm) minimum beyond the inside face of a handrail complying with Section 1012.

1010.10 Guards. Guards shall be provided where required by Section 1013 and shall be constructed in accordance with Section 1013.

SECTION 1011 EXIT SIGNS

1011.1 Where required. See Section 1006.3.

SECTION 1012 HANDRAILS

1012.1 Where required. Handrails for stairways and ramps shall be adequate in strength and attachment in accordance with Section 1607.7. Handrails required for stairways by Section 1009.10 shall comply with Sections 1012.2 through 1012.8. Handrails required for ramps by Section 1010.8 shall comply with Sections 1012.2 through 1012.7.

1012.2 Height. Handrail height, measured above stair tread nosings, or finish surface of ramp slope shall be uniform, not less than 34 inches (864 mm) and not more than 38 inches (965 mm).

Exception: Handrails for stairs not required to be accessible that form part of a guardrail may be 42 inches (1067 mm) high.

1012.3 Handrail graspability. Handrails with a circular cross-section shall have an outside diameter of at least 1.25 inches (51 mm) and not greater than 2 inches (51 mm) or shall provide equivalent graspability. If the handrail is not circular, it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6.25 inches (160 mm) with a maximum cross-section dimension of 2.25 inches (57 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).

Exception: Accessible handrails shall meet the requirements of Section 11-4.26.2.

1012.4 Continuity. Handrail-gripping surfaces shall be continuous, without interruption by newel posts or other obstructions.

Exceptions:

1. Handrails within dwelling units are permitted to be interrupted by a newel post at a stair or ramp landing.
2. Within a dwelling unit, the use of a volute, turnout or starting easing is allowed on the lowest tread.
3. Handrail brackets or balusters attached to the bottom surface of the handrail shall not be considered obstructions to graspability, provided that the following conditions are met:
 - 3.1. They do not project horizontally beyond the sides of the handrail within 1½ inches (38 mm) of the bottom of the handrail and provided that, for each ½ inch (12.7 mm) of additional handrail perimeter dimension above 4 inches (102 mm), the vertical clearance dimension of 1½ inches (38 mm) can be reduced by ⅛ inch (.3 mm).

- 3.2. They have edges with a radius of not less than .01 inch (0.25 mm).
- 3.3. They obstruct not in excess of 20 percent of the handrail length.

1012.5 Handrail extensions. Handrails shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stair flight or ramp run. At stairways where handrails are not continuous between flights, the handrails shall extend horizontally at least 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At ramps where handrails are not continuous between runs, the handrails shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of ramp runs.

Exceptions:

1. Handrails within a dwelling unit that is not required to be accessible need extend only from the top riser to the bottom riser.
2. Aisle handrails in Group A occupancies in accordance with Section 1025.13.
3. Accessible handrail extensions shall be as per Section 11-4.8.5(2).

1012.6 Clearance. Clear space between a handrail and a wall or other surface shall be a minimum of 1.5 inches (38 mm). A handrail and a wall or other surface adjacent to the handrail shall be free of any sharp or abrasive elements.

Exception: Accessible handrails shall comply with Section 11-4.8.5(3).

1012.7 Projections. On ramps, the clear width between handrails shall be 36 inches (914 mm) minimum. Projections into the required width of stairways and ramps at each handrail shall not exceed 4.5 inches (114 mm) at or below the handrail height. Projections into the required width shall not be limited above the minimum headroom height required in Section 1009.2.

1012.8 Intermediate handrails. Handrails shall be provided within 30 inches (762 mm) of all portions of the stair width required for egress capacity in accordance with Table 1005.1. The required egress width shall be along the natural path of travel.

1012.8.1 Where new intermediate handrails are provided in accordance with Section 1012.8, the minimum clear width between handrails shall be 20 inches (510 mm).

1012.9 For provisions related to handrails on stairs which are required to be accessible, refer to Sections 11-4.9.1 and 11-4.9.4.

SECTION 1013 GUARDS

1013.1 Where required. Guards shall be located along open-sided walking surfaces, mezzanines, industrial equipment platforms, stairways, ramps and landings that are located more than 30 inches (762 mm) above the floor or grade below. Guards shall be adequate in strength and attachment in accordance with Section 1607.7. Where glass is used to provide a guard or as a portion of the guard system, the guard shall also

comply with Section 2407. Guards shall also be located along glazed sides of stairways, ramps and landings that are located more than 30 inches (762 mm) above the floor or grade below where the glazing provided does not meet the strength and attachment requirements in Section 1607.7.

Exception: Guards are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of stages and raised platforms, including steps leading up to the stage and raised platforms.
3. On raised stage and platform floor areas, such as runways, ramps and side stages used for entertainment or presentations.
4. At vertical openings in the performance area of stages and platforms.
5. At elevated walking surfaces appurtenant to stages and platforms for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating where guards in accordance with Section 1025.14 are permitted and provided.

1013.2 Height. Guards shall form a protective barrier not less than 42 inches (1067 mm) high, measured vertically above the leading edge of the tread, adjacent walking surface or adjacent seatboard.

Exceptions:

1. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards whose top rail also serves as a handrail shall have a height not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from the leading edge of the stair tread nosing.
2. The height in assembly seating areas shall be in accordance with Section 1025.14.

1013.3 Opening limitations. Open guards shall have balusters or ornamental patterns such that a 4-inch-diameter (102 mm) sphere cannot pass through any opening up to a height of 34 inches (864 mm). From a height of 34 inches (864 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, a sphere 8 inches (203 mm) in diameter shall not pass.

Exceptions:

1. The triangular openings formed by the riser, tread and bottom rail at the open side of a stairway shall be of a maximum size such that a sphere of 6 inches (152 mm) in diameter cannot pass through the opening.
2. At elevated walking surfaces for access to and use of electrical, mechanical or plumbing systems or equipment, guards shall have balusters or be of solid materials such that a sphere with a diameter of 21 inches (533 mm) cannot pass through any opening.
3. In areas that are not open to the public within occupancies in Group I-3, F, H or S, balusters, horizontal intermediate rails or other construction shall not per-

mit a sphere with a diameter of 21 inches (533 mm) to pass through any opening.

4. In assembly seating areas, guards at the end of aisles where they terminate at a fascia of boxes, balconies and galleries shall have balusters or ornamental patterns such that a 4-inch-diameter (102 mm) sphere cannot pass through any opening up to a height of 26 inches (660 mm). From a height of 26 inches (660 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, a sphere 8 inches (203 mm) in diameter shall not pass.
5. Within individual dwelling units and sleeping units in Group R-2 and R-3 occupancies, openings for required guards on the sides of stair treads shall not allow a sphere of 4.375 inches (111 mm) to pass through.

1013.4 Screen porches. Porches and decks which are enclosed with insect screening shall be provided with guards where the walking surface is located more than 30 inches (762 mm) above the floor or grade below.

1013.5 Mechanical equipment. Guards shall be provided where appliances, equipment, fans, roof hatch openings or other components that require service are located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall be constructed so as to prevent the passage of a 21-inch-diameter (533 mm) sphere. The guard shall extend not less than 30 inches (762 mm) beyond each end of such appliance, equipment, fan or component.

1013.6 Roof access. Guards shall be provided where the roof hatch opening is located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall be constructed so as to prevent the passage of a 21-inch-diameter (533 mm) sphere.

SECTION 1014 EXIT ACCESS

1014.1 General. The exit access arrangement shall comply with Sections 1014 through 1017 and the applicable provisions of Sections 1003 through 1013.

1014.2 Egress through intervening spaces. Egress through intervening spaces shall comply with this section.

1. Egress from a room or space shall not pass through adjoining or intervening rooms or areas, except where such adjoining rooms or areas are accessory to the area served, are not a high-hazard occupancy and provide a discernible path of egress travel to an exit.

Exception: Means of egress are not prohibited through adjoining or intervening rooms or spaces in a Group H, S or F occupancy when the adjoining or intervening rooms or spaces are the same or a lesser hazard occupancy group.

2. Egress shall not pass through kitchens, storage rooms, closets or spaces used for similar purposes.

Exceptions:

1. Means of egress are not prohibited through a kitchen area serving adjoining rooms constituting part of the same dwelling unit or sleeping unit.
2. Means of egress are not prohibited through stockrooms in Group M occupancies when all of the following are met:
 - 2.1. The stock is of the same hazard classification as that found in the main retail area;
 - 2.2. Not more than 50 percent of the exit access is through the stockroom;
 - 2.3. The stockroom is not subject to locking from the egress side; and
 - 2.4. There is a demarcated, minimum 44-inch-wide (1118 mm) aisle defined by full or partial height fixed walls or similar construction that will maintain the required width and lead directly from the retail area to the exit without obstructions.
3. An exit access shall not pass through a room that can be locked to prevent egress.
4. Means of egress from dwelling units or sleeping areas shall not lead through other sleeping areas, toilet rooms or bathrooms.

1014.2.1 Multiple tenants. Where more than one tenant occupies any one floor of a building or structure, each tenant space, dwelling unit and sleeping unit shall be provided with access to the required exits without passing through adjacent tenant spaces, dwelling units and sleeping units.

Exception: Means of egress shall not be prohibited through adjoining tenant space where such rooms or spaces occupy less than 10 percent of the area of the tenant space through which they pass; are the same or similar occupancy group; a discernible path of egress travel to an exit is provided; and the means of egress into the adjoining space is not subject to locking from the egress side. A required means of egress serving the larger tenant space shall not pass through the smaller tenant space or spaces.

1014.2.2 Group I-2. Habitable rooms or suites in Group I-2 occupancies shall have an exit access door leading directly to a corridor.

Exceptions:

1. Rooms with exit doors opening directly to the outside at ground level.
2. Patient sleeping rooms are permitted to have one intervening room if the intervening room is not used as an exit access for more than eight patient beds.
3. Special nursing suites are permitted to have one intervening room where the arrangement allows

for direct and constant visual supervision by nursing personnel.

4. For rooms other than patient sleeping rooms located within a suite, exit access travel from within the suite shall be permitted through one intervening room where the travel distance to the exit access door is not greater than 100 feet (30 480 mm).
5. For rooms other than patient sleeping rooms located within a suite, exit access travel from within the suite shall be permitted through two intervening rooms where the travel distance to the exit access door is not greater than 50 feet (15 240 mm).

Suites of sleeping rooms shall not exceed 5,000 square feet (465 m²). Suites of rooms other than patient sleeping rooms shall not exceed 10,000 square feet (929 m²). Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (93 m²) shall have at least two exit access doors remotely located from each other. Any room or suite of rooms other than patient sleeping rooms of more than 2,500 square feet (232 m²) shall have at least two access doors remotely located from each other. The travel distance between any point in a Group I-2 occupancy and an exit access door in the room shall not exceed 50 feet (15 240 mm). The travel distance between any point in a suite of sleeping rooms and an exit access door of that suite shall not exceed 100 feet (30 480 mm).

1014.3 Common path of egress travel. In occupancies other than Groups H-1, H-2 and H-3, the common path of egress travel shall not exceed 75 feet (22 860 mm). In Group H-1, H-2 and H-3 occupancies, the common path of egress travel shall not exceed 25 feet (7620 mm). For common path of egress travel in Group A occupancies having fixed seating, see Section 1025.8.

Exceptions:

1. The length of a common path of egress travel in Group B, F, M and S occupancies shall not be more than 100 feet (30 480 mm), provided that the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
2. Where a tenant space in Group B, S and U occupancies has an occupant load of not more than 30, the length of a common path of egress travel shall not be more than 100 feet (30 480 mm).
3. The length of a common path of egress travel in a Group I-3 occupancy shall not be more than 100 feet (30 480 mm).
4. the length of a common path of egress travel in a Group R-2 occupancy shall not be more than 125 feet (38 100 mm), within the dwelling unit, provided that the building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 otherwise 75 feet.
5. Where a tenant space in Group A occupancy has an occupant load of more than 50, the length of a com-

mon path of egress travel shall not be more than 20 feet (6098 mm).

6. The common path of egress travel in Group R1 and R2 occupancies shall not exceed 35 feet (10 668 mm). Travel within a guestroom, guest suite or dwelling unit shall not be included when calculating the common path of travel. The common path of egress travel in occupancy Groups R1 and R2 shall not exceed 50 feet (15 240 mm) provided the building is protected throughout by an approved, automatic sprinkler system in accordance with Section 903.3.1.1.
7. The common path of egress travel in occupancies in Group F and S shall be 50 feet (15 240 mm) in unsprinklered buildings.
8. The common path of egress travel in Group S2 parking garages shall be 50 feet (15 240 mm).
9. In occupancy Group S2 common paths of egress travel shall not be limited.
10. In occupancy Group H common paths of egress travel shall be prohibited.

1014.4 Aisles. Aisles serving as a portion of the exit access in the means of egress system shall comply with the requirements of this section. Aisles shall be provided from all occupied portions of the exit access which contain seats, tables, furnishings, displays and similar fixtures or equipment. Aisles serving assembly areas, other than seating at tables, shall comply with Section 1025. Aisles serving reviewing stands, grandstands and bleachers shall also comply with Section 1025.

The required width of aisles shall be unobstructed.

Exception: Doors, when fully opened, and handrails shall not reduce the required width by more than 7 inches (178 mm). Doors in any position shall not reduce the required width by more than one-half. Other nonstructural projections such as trim and similar decorative features are permitted to project into the required width 1.5 inches (38 mm) from each side.

1014.4.1 Aisles in Groups B and M. In Group B and M occupancies, the minimum clear aisle width shall be determined by Section 1005.1 for the occupant load served, but shall not be less than 36 inches (914 mm).

Exception: Nonpublic aisles serving less than 50 people and not required to be accessible by Chapter 11 need not exceed 28 inches (711 mm) in width.

1014.4.2 Aisle accessways in Group M. An aisle accessway shall be provided on at least one side of each element within the merchandise pad. The minimum clear width for an aisle accessway not required to be accessible shall be 30 inches (762 mm). The required clear width of the aisle accessway shall be measured perpendicular to the elements and merchandise within the merchandise pad. The 30-inch (762 mm) minimum clear width shall be maintained to provide a path to an adjacent aisle or aisle accessway. The common path of travel shall not exceed 30 feet (9144 mm) from any point in the merchandise pad.

Exception: For areas serving not more than 50 occupants, the common path of travel shall not exceed 75 feet (22 880 mm).

1014.4.3 Seating at tables. Where seating is located at a table or counter and is adjacent to an aisle or aisle accessway, the measurement of required clear width of the aisle or aisle accessway shall be made to a line 19 inches (483 mm) away from and parallel to the edge of the table or counter. The 19-inch (483 mm) distance shall be measured perpendicular to the side of the table or counter. In the case of other side boundaries for aisle or aisle accessways, the clear width shall be measured to walls, edges of seating and tread edges, except that handrail projections are permitted.

Exception: Where tables or counters are served by fixed seats, the width of the aisle accessway shall be measured from the back of the seat.

1014.4.3.1 Aisle accessway for tables and seating. Aisle accessways serving arrangements of seating at tables or counters shall have sufficient clear width to conform to the capacity requirements of Section 1005.1 but shall not have less than the appropriate minimum clear width specified in Section 1014.4.3.2.

1014.4.3.2 Table and seating accessway width. Aisle accessways shall provide a minimum of 12 inches (305 mm) of width plus 0.5 inch (12.7 mm) of width for each additional 1 foot (305 mm), or fraction thereof, beyond 12 feet (3658 mm) of aisle accessway length measured from the center of the seat farthest from an aisle.

Exception: Portions of an aisle accessway having a length not exceeding 6 feet (1829 mm) and used by a total of not more than four persons.

1014.4.3.3 Table and seating aisle accessway length. The length of travel along the aisle accessway shall not exceed 30 feet (9144 mm) from any seat to the point where a person has a choice of two or more paths of egress travel to separate exits.

1014.5 Egress balconies. Balconies used for egress purposes shall conform to the same requirements as corridors for width, headroom, dead ends and projections.

1014.5.1 Wall separation. Exterior egress balconies shall be separated from the interior of the building by walls and opening protectives as required for corridors.

Exception: Separation is not required where the exterior egress balcony is served by at least two stairs and a dead-end travel condition does not require travel past an unprotected opening to reach a stair.

1014.5.2 Openness. The long side of an egress balcony shall be at least 50 percent open, and the open area above the guards shall be so distributed as to minimize the accumulation of smoke or toxic gases.

**SECTION 1015
EXIT AND EXIT ACCESS DOORWAYS**

1015.1 Exit or exit access doorways required. Two exits or exit access doorways from any space shall be provided where one of the following conditions exists:

1. The occupant load of the space exceeds the values in Table 1015.1.
2. The common path of egress travel exceeds the limitations of Section 1014.3.
3. Where required by Sections 1015.3, 1015.4 and 1015.5.

Exception: Group I-2 occupancies shall comply with Section 1014.2.2.

**TABLE 1015.1
SPACES WITH ONE MEANS OF EGRESS**

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, D, E, F, M, U, R-2, R-3	49
H-1, H-2, H-3	3
H-4, H-5, I-1, I-3, R-1, R-4	10
S	29

a. Day care maximum occupant load is 10.

1015.1.1 Three or more exits. Access to three or more exits shall be provided from a floor area where required by Section 1019.1.

1015.2 Exit or exit access doorway arrangement. Required exits shall be located in a manner that makes their availability obvious. Exits shall be unobstructed at all times. Exit and exit access doorways shall be arranged in accordance with Sections 1015.2.1 and 1015.2.2.

1015.2.1 Two exits or exit access doorways. Where two exits or exit access doorways are required from any portion of the exit access, the exit doors or exit access doorways shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between exit doors or exit access doorways. Interlocking or scissor stairs shall be counted as one exit stairway.

Exceptions:

1. Where exit enclosures are provided as a portion of the required exit and are interconnected by a 1-hour fire-resistance-rated corridor conforming to the requirements of Section 1017, the required exit separation shall be measured along the shortest direct line of travel within the corridor.
2. Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of the exit doors or exit access doorways shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served.
3. In Group R-1 and R-2 occupancies, the distance between exits is not applicable to common

nonlooped exit access corridors in a building that has corridor doors from the guestroom or guest suite or dwelling unit, which are arranged so that the exits are located in opposite directions from such doors.

1015.2.2 Three or more exits or exit access doorways.

Where access to three or more exits is required, at least two exit doors or exit access doorways shall be arranged in accordance with the provisions of Section 1015.2.1.

1015.3 Boiler, incinerator and furnace rooms. Two exit access doorways are required in boiler, incinerator and furnace rooms where the area is over 500 square feet (46 m²) and any fuel-fired equipment exceeds 400,000 British thermal units (Btu) (422 000 KJ) input capacity. Where two exit access doorways are required, one is permitted to be a fixed ladder or an alternating tread device. Exit access doorways shall be separated by a horizontal distance equal to one-half the length of the maximum overall diagonal dimension of the room.

1015.4 Refrigeration machinery rooms. Machinery rooms larger than 1,000 square feet (93 m²) shall have not less than two exits or exit access doors. Where two exit access doorways are required, one such doorway is permitted to be served by a fixed ladder or an alternating tread device. Exit access doorways shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of room.

All portions of machinery rooms shall be within 150 feet (45 720 mm) of an exit or exit access doorway. An increase in travel distance is permitted in accordance with Section 1016.1.

Doors shall swing in the direction of egress travel, regardless of the occupant load served. Doors shall be tight fitting and self-closing.

1015.5 Refrigerated rooms or spaces. Rooms or spaces having a floor area of 1,000 square feet (93 m²) or more, containing a refrigerant evaporator and maintained at a temperature below 68°F (20°C), shall have access to not less than two exits or exit access doors.

Travel distance shall be determined as specified in Section 1016.1, but all portions of a refrigerated room or space shall be within 150 feet (45 720 mm) of an exit or exit access door where such rooms are not protected by an approved automatic sprinkler system. Egress is allowed through adjoining refrigerated rooms or spaces.

Exception: Where using refrigerants in quantities limited to the amounts based on the volume set forth in the *Florida Building Code, Mechanical*.

1015.6 Stage means of egress. Where two means of egress are required, based on the stage size or occupant load, one means of egress shall be provided on each side of the stage.

1015.6.1 Gallery, gridiron and catwalk means of egress.

The means of egress from lighting and access catwalks, galleries and gridirons shall meet the requirements for occupancies in Group F-2.

Exceptions:

1. A minimum width of 22 inches (559 mm) is permitted for lighting and access catwalks.
2. Spiral stairs are permitted in the means of egress.

3. Stairways required by this subsection need not be enclosed.
4. Stairways with a minimum width of 22 inches (559 mm), ladders, or spiral stairs are permitted in the means of egress.
5. A second means of egress is not required from these areas where a means of escape to a floor or to a roof is provided. Ladders, alternating tread devices or spiral stairs are permitted in the means of escape.
6. Ladders are permitted in the means of egress.

SECTION 1016 EXIT ACCESS TRAVEL DISTANCE

1016.1 Travel distance limitations. Exits shall be so located on each story such that the maximum length of exit access travel, measured from the most remote point within a story to the entrance to an exit along the natural and unobstructed path of egress travel, shall not exceed the distances given in Table 1016.1.

Where the path of exit access includes unenclosed stairways or ramps within the exit access or includes unenclosed exit ramps or stairways as permitted in Section 1020.1, the distance of travel on such means of egress components shall also be included in the travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.

Exceptions:

1. Travel distance in open parking garages is permitted to be measured to the closest riser of open stairs.
2. In outdoor facilities with open exit access components and open exterior stairs or ramps, travel distance is permitted to be measured to the closest riser of a stair or the closest slope of the ramp.
3. Where an exit stair is permitted to be unenclosed in accordance with Exception 8 or 9 of Section 1020.1, the travel distance shall be measured from the most remote point within a building to an exit discharge.

1016.2 Roof vent increase. In buildings that are one story in height, equipped with automatic heat and smoke roof vents complying with Section 910 and equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the maximum exit access travel distance shall be 400 feet (122 m) for occupancies in Group F-1 or S-1.

1016.3 Exterior egress balcony increase. Travel distances specified in Section 1016.1 shall be increased up to an additional 100 feet (30 480 mm) provided the last portion of the exit access leading to the exit occurs on an exterior egress balcony constructed in accordance with Section 1014.5. The length of such balcony shall not be less than the amount of the increase taken.

**TABLE 1016.1
EXIT ACCESS TRAVEL DISTANCE^a**

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
R ^d	100 ^e	200 ^b
M	150	250 ^e
A, F-1, I-1	200	250 ^b
B	200	300 ^e
S-1	200	400 ^e
F-2, S-2, U	300	400 ^e
H-1	Not Permitted	75 ^c
H-2	Not Permitted	100 ^c
H-3	Not Permitted	150 ^c
H-4	Not Permitted	175 ^c
H-5	Not Permitted	200 ^e
E, D, S-2 ^f I-2, I-3	150	200 ^e

For SI: 1 foot = 304.8 mm.

- a. See the following sections for modifications to exit access travel distance requirements:
 Section 402: For the distance limitation in malls.
 Section 404: For the distance limitation through an atrium space.
 Section 1016.2 For increased limitations in Groups F-1 and S-1.
 Section 1025.7: For increased limitation in assembly seating.
 Section 1025.7: For increased limitation for assembly open-air seating.
 Section 1019.2: For buildings with one exit.
 Chapter 31: For the limitation in temporary structures.
- b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems in accordance with Section 903.3.1.2 are permitted.
- c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
- d. Travel within a guestroom, guest suite or dwelling unit shall not be included when calculating the travel distance. See Section 1014.3, Exception 4 for common path within.
- e. For exterior 200 feet is allowed without sprinkler.
- f. Enclosed parking garage.

**SECTION 1017
CORRIDORS**

1017.1 Construction. Corridors shall be fire-resistance rated in accordance with Table 1017.1. The corridor walls required to be fire-resistance rated shall comply with Section 708 for fire partitions.

Exceptions:

1. A fire-resistance rating is not required for corridors in an occupancy in Group E where each room that is used for instruction has at least one door directly to the exterior and rooms for assembly purposes have at least one-half of the required means of egress doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.
2. A fire-resistance rating is not required for corridors contained within a dwelling or sleeping unit in an occupancy in Group R.
3. A fire-resistance rating is not required for corridors in open parking garages.
4. A fire-resistance rating is not required for corridors in an occupancy in Group B which is a space requiring only a single means of egress complying with Section 1015.1.

1017.2 Corridor width. The minimum corridor width shall be as determined in Section 1005.1, but not less than 44 inches (1118 mm).

Exceptions:

1. Twenty-four inches (610 mm)—For access to and utilization of electrical, mechanical or plumbing systems or equipment.
2. Thirty-six inches (914 mm)—With a required occupant capacity of less than 50.
3. Thirty-six inches (914 mm)—Within a dwelling unit.
4. Seventy-two inches (1829 mm)—In Group E with a corridor having a required capacity of 100 or more.

**TABLE 1017.1
CORRIDOR FIRE-RESISTANCE RATING**

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system ^c
H-1, H-2, H-3	All	1	1
A, H-4, H-5	Greater than 30	1	1
B, D, E ^c , F, M, S, U	Greater than 30	1	0
R	Greater than 10	1	1
I-2 ^a	All	Not Permitted	0
I-1, I-3	All	Not Permitted	1 ^b

- a. For requirements for occupancies in Group I-2, see Section 407.3.
- b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
- c. In buildings protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 903, corridor walls shall not be required to be rated, provided that such walls form smoke partitions in accordance with the *Florida Fire Prevention Code*.

5. Seventy-two inches (1829 mm)—In corridors serving surgical Group I, health care centers for ambulatory patients receiving outpatient medical care, which causes the patient to be not capable of self-preservation.
6. Ninety-six inches (2438 mm)—In Group I-2 in areas where required for bed movement.

1017.3 Dead ends. Where more than one exit or exit access doorway is required, the exit access shall be arranged such that there are no dead ends in corridors more than 20 feet (6096 mm) in length.

Exceptions:

1. In occupancies in Group I-3 of Occupancy Condition 2, 3 or 4 (see Section 308.4), the dead end in a corridor shall not exceed 50 feet (15 240 mm).
2. In occupancies in Groups B and F where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the length of dead-end corridors shall not exceed 50 feet (15 240 mm).
3. A dead-end corridor shall not be limited in length where the length of the dead-end corridor is less than 2.5 times the least width of the dead-end corridor.

1017.4 Air movement in corridors. Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

Exceptions:

1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted, provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of 1,000 square feet (93 m²) or less in area, utilization of corridors for conveying return air is permitted.

1017.4.1 Corridor ceiling. Use of the space between the corridor ceiling and the floor or roof structure above as a return air plenum is permitted for one or more of the following conditions:

1. The corridor is not required to be of fire-resistance-rated construction;
2. The corridor is separated from the plenum by fire-resistance-rated construction;
3. The air-handling system serving the corridor is shut down upon activation of the air-handling unit smoke detectors required by the *Florida Building Code, Mechanical*.
4. The air-handling system serving the corridor is shut down upon detection of sprinkler waterflow where the building is equipped throughout with an automatic sprinkler system; or

5. The space between the corridor ceiling and the floor or roof structure above the corridor is used as a component of an approved engineered smoke control system.

1017.5 Corridor continuity. Fire-resistance-rated corridors shall be continuous from the point of entry to an exit, and shall not be interrupted by intervening rooms.

Exception: Foyers, lobbies or reception rooms constructed as required for corridors shall not be construed as intervening rooms.

**SECTION 1018
EXITS**

1018.1 General. Exits shall comply with Sections 1018 through 1023 and the applicable requirements of Sections 1003 through 1013. An exit shall not be used for any purpose that interferes with its function as a means of egress. Once a given level of exit protection is achieved, such level of protection shall not be reduced until arrival at the exit discharge.

1018.2 Exterior exit doors. Buildings or structures used for human occupancy shall have at least one exterior door that meets the requirements of Section 1008.1.1.

1018.2.1 Detailed requirements. Exterior exit doors shall comply with the applicable requirements of Section 1008.1.

1018.2.2 Arrangement. Exterior exit doors shall lead directly to the exit discharge or the public way.

**SECTION 1019
NUMBER OF EXITS AND CONTINUITY**

1019.1 Minimum number of exits. All rooms and spaces within each story shall be provided with and have access to the minimum number of approved independent exits required by Table 1019.1 based on the occupant load of the story, except as modified in Section 1015.1 or 1019.2. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories. The required number of exits from any story, basement or individual space shall be maintained until arrival at grade or the public way.

Exception: A fenced outdoor assembly occupancy shall have at least two widely separated means of egress from the enclosure. If more than 6,000 persons are to be served by such means of egress, there shall be at least three means of egress; if more than 9,000 persons are to be served, there shall be at least four means of egress.

**TABLE 1019.1
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD**

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

1019.1.1 Parking structures. Parking structures shall not have less than two exits from each parking tier, except that only one exit is required where vehicles are mechanically

parked. Vehicle ramps shall not be considered as required exits unless pedestrian facilities are provided.

1019.1.2 Helistops. The means of egress from helistops shall comply with the provisions of this chapter, provided that landing areas located on buildings or structures shall have two or more exits. For landing platforms or roof areas less than 60 feet (18 288 mm) long, or less than 2,000 square feet (186 m²) in area, the second means of egress is permitted to be a fire escape or ladder leading to the floor below.

1019.2 Buildings with one exit. Only one exit shall be required in buildings as described below:

1. Buildings described in Table 1019.2, provided that the building has not more than one level below the first story above grade plane.
2. Buildings of Group R-3 occupancy.
3. Single-level buildings with the occupied space at the level of exit discharge provided that the story or space complies with Section 1015.1 as a space with one means of egress.

**TABLE 1019.2
BUILDINGS WITH ONE EXIT**

OCCUPANCY	MAXIMUM HEIGHT OF BUILDING ABOVE GRADE PLANE	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
A, B ^d , D, E ^c , F, M, U	1 Story	49 occupants and 75 feet travel distance
H-2, H-3	1 Story	3 occupants and 25 feet travel distance
H-4, H-5, I, R	1 Story	10 occupants and 75 feet travel distance
S ^a	1 Story	29 occupants and 100 feet travel distance
B ^b , F, M, S ^a	2 Stories	30 occupants and 75 feet travel distance
R-2	2 Stories ^c	4 dwelling units and 50 feet travel distance

For SI: 1 foot = 304.8 mm.

- a. For the required number of exits for parking structures, see Section 1019.1.1.
- b. For the required number of exits for air traffic control towers, see Section 412.1.
- c. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1026 shall have a maximum height of three stories above grade plane.
- d. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 with an occupancy in Group B shall have a maximum travel distance of 100 feet.
- e. Day care maximum occupant load is 10.

1019.3 Exit continuity. Exits shall be continuous from the point of entry into the exit to the exit discharge.

1019.4 Exit door arrangement. Exit door arrangement shall meet the requirements of Sections 1015.2 through 1015.2.2.

**SECTION 1020
VERTICAL EXIT ENCLOSURES**

1020.1 Enclosures required. Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit enclosure shall include any basements but not any mezzanines. An exit enclosure shall not be used for any purpose other than means of egress.

Exceptions:

1. In all occupancies, other than Group H and I occupancies, a stairway is not required to be enclosed when the stairway serves an occupant load of less than 10 and the stairway complies with either Item 1.1 or 1.2. In all cases, the maximum number of connecting open stories shall not exceed two.
 - 1.1. The stairway is open to not more than one story above the story at the level of exit discharge; or
 - 1.2. The stairway is open to not more than one story below the story at the level of exit discharge.
2. Exits in buildings of Group A-5 where all portions of the means of egress are essentially open to the outside need not be enclosed.
3. Stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
4. Stairways that are not a required means of egress element are not required to be enclosed where such stairways comply with Section 707.2.
5. Stairways in open parking structures that serve only the parking structure are not required to be enclosed.
6. Stairways in Group I-3 occupancies, as provided for in Section 408.3.6, are not required to be enclosed.
7. Means of egress stairways as required by Section 410.5.3 are not required to be enclosed.
8. In other than Group H and I occupancies, a maximum of 50 percent of egress stairways serving one adjacent floor are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Any two such interconnected floors shall not be open to other floors. Unenclosed exit stairways shall be remotely located as required in Section 1015.2.
9. In other than Group H and I occupancies, interior egress stairways serving only the first and second stories of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Such inter-

connected stories shall not be open to other stories. Unenclosed exit stairways shall be remotely located as required in Section 1015.2.

1020.1.1 Openings and penetrations. Exit enclosure opening protectives shall be in accordance with the requirements of Section 715.

Except as permitted in Section 402.4.6, openings in exit enclosures other than unprotected exterior openings shall be limited to those necessary for exit access to the enclosure from normally occupied spaces and for egress from the enclosure.

Where interior exit enclosures are extended to the exterior of a building by an exit passageway, the door assembly from the exit enclosure to the exit passageway shall be protected by a fire door assembly conforming to the requirements in Section 715.4. Fire door assemblies in exit enclosures shall comply with Section 715.4.4.

Elevators shall not open into an exit enclosure.

1020.1.2 Penetrations. Penetrations into and openings through an exit enclosure are prohibited except for required exit doors, equipment and ductwork necessary for independent pressurization, sprinkler piping, standpipes, electrical raceway for fire department communication systems and electrical raceway serving the exit enclosure and terminating at a steel box not exceeding 16 square inches (0.010 m²). Such penetrations shall be protected in accordance with Section 712. There shall be no penetrations or communication openings, whether protected or not, between adjacent exit enclosures.

1020.1.3 Ventilation. Equipment and ductwork for exit enclosure ventilation as permitted by Section 1020.1.2 shall comply with one of the following items:

1. Such equipment and ductwork shall be located exterior to the building and shall be directly connected to the exit enclosure by ductwork enclosed in construction as required for shafts.
2. Where such equipment and ductwork is located within the exit enclosure, the intake air shall be taken directly from the outdoors and the exhaust air shall be discharged directly to the outdoors, or such air shall be conveyed through ducts enclosed in construction as required for shafts.
3. Where located within the building, such equipment and ductwork shall be separated from the remainder of the building, including other mechanical equipment, with construction as required for shafts.

In each case, openings into the fire-resistance-rated construction shall be limited to those needed for maintenance and operation and shall be protected by opening protectives in accordance with Section 715 for shaft enclosures.

Exit enclosure ventilation systems shall be independent of other building ventilation systems.

1020.1.4 Exit enclosure exterior walls. Exterior walls of an exit enclosure shall comply with the requirements of Section 704 for exterior walls. Where nonrated walls or unprotected openings enclose the exterior of the stairway and the walls

or openings are exposed by other parts of the building at an angle of less than 180 degrees (3.14 rad), the building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a fire-resistance rating of not less than 1 hour. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than $\frac{3}{4}$ hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the topmost landing of the stairway or to the roof line, whichever is lower.

1020.1.5 Discharge identification barrier. A stairway in an exit enclosure shall not continue below the level of exit discharge unless an approved barrier is provided at the level of exit discharge to prevent persons from unintentionally continuing into levels below. Directional exit signs shall be provided as specified in Section 1011.

1020.1.6 Stairway floor number signs. A sign shall be provided at each floor landing in interior exit enclosures connecting more than three stories designating the floor level, the terminus of the top and bottom of the stair enclosure and the identification of the stair. The signage shall also state the story of, and the direction to the exit discharge and the availability of roof access from the stairway for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions.

1020.1.7 Smokeproof enclosures. In buildings required to comply with Section 403 or 405, each of the exits of a building that serves stories where the floor surface is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the level of exit discharge serving such floor levels shall be a smokeproof enclosure or pressurized stairway in accordance with Section 909.20.

1020.1.7.1 Enclosure exit. A smokeproof enclosure or pressurized stairway shall exit into a public way or into an exit passageway, yard or open space having direct access to a public way. The exit passageway shall be without other openings and shall be separated from the remainder of the building by 2-hour fire-resistance-rated construction.

Exceptions:

1. Openings in the exit passageway serving a smokeproof enclosure are permitted where the exit passageway is protected and pressurized in the same manner as the smokeproof enclosure, and openings are protected as required for access from other floors.
2. Openings in the exit passageway serving a pressurized stairway are permitted where the exit passageway is protected and pressurized in the same manner as the pressurized stairway.
3. A smokeproof enclosure or pressurized stairway shall be permitted to egress through areas on the level of discharge or vestibules as permitted by Section 1024.

1020.1.7.2 Enclosure access. Access to the stairway within a smokeproof enclosure shall be by way of a vestibule or an open exterior balcony.

Exception: Access is not required by way of a vestibule or exterior balcony for stairways using the pressurization alternative complying with Section 909.20.5.

SECTION 1021 EXIT PASSAGEWAYS

1021.1 Exit passageway. Exit passageways serving as an exit component in a means of egress system shall comply with the requirements of this section. An exit passageway shall not be used for any purpose other than as a means of egress.

1021.2 Width. The width of exit passageways shall be determined as specified in Section 1005.1 but such width shall not be less than 44 inches (1118 mm), except that exit passageways serving an occupant load of less than 50 shall not be less than 36 inches (914 mm) in width.

The required width of exit passageways shall be unobstructed.

Exception: Doors, when fully opened, and handrails, shall not reduce the required width by more than 7 inches (178 mm). Doors in any position shall not reduce the required width by more than one-half. Other nonstructural projections such as trim and similar decorative features are permitted to project into the required width 1.5 inches (38 mm) on each side.

1021.3 Construction. Exit passageway enclosures shall have walls, floors and ceilings of not less than 1-hour fire-resistance rating, and not less than that required for any connecting exit enclosure. Exit passageways shall be constructed as fire barriers in accordance with Section 706.

1021.4 Openings and penetrations. Exit passageway opening protectives shall be in accordance with the requirements of Section 715.

Except as permitted in Section 402.4.6, openings in exit passageways other than unexposed exterior openings shall be limited to those necessary for exit access to the exit passageway from normally occupied spaces and for egress from the exit passageway.

Where interior exit enclosures are extended to the exterior of a building by an exit passageway, the door assembly from the exit enclosure to the exit passageway shall be protected by a fire door conforming to the requirements in Section 715.4. Fire door assemblies in exit passageways shall comply with Section 715.4.4.

Elevators shall not open into an exit passageway.

1021.5 Penetrations. Penetrations into and openings through an exit passageway are prohibited except for required exit doors, equipment and ductwork necessary for independent pressurization, sprinkler piping, standpipes, electrical raceway for fire department communication and electrical raceway serving the exit passageway and terminating at a steel box not exceeding 16 square inches (0.010 m²). Such penetrations shall be protected in accordance with Section 712. There shall be no

penetrations or communicating openings, whether protected or not, between adjacent exit passageways.

SECTION 1022 HORIZONTAL EXITS

1022.1 Horizontal exits. Horizontal exits serving as an exit in a means of egress system shall comply with the requirements of this section. A horizontal exit shall not serve as the only exit from a portion of a building, and where two or more exits are required, not more than one-half of the total number of exits or total exit width shall be horizontal exits.

Exceptions:

1. Horizontal exits are permitted to comprise two-thirds of the required exits from any building or floor area for occupancies in Group I-2.
2. Horizontal exits are permitted to comprise 100 percent of the exits required for occupancies in Group I-3. At least 6 square feet (0.6 m²) of accessible space per occupant shall be provided on each side of the horizontal exit for the total number of people in adjoining compartments.

Every fire compartment for which credit is allowed in connection with a horizontal exit shall not be required to have a stairway or door leading directly outside, provided the adjoining fire compartments have stairways or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates.

The area into which a horizontal exit leads shall be provided with exits adequate to meet the occupant requirements of this chapter, but not including the added occupant capacity imposed by persons entering it through horizontal exits from another area. At least one of its exits shall lead directly to the exterior or to an exit enclosure.

1022.2 Separation. The separation between buildings or refuge areas connected by a horizontal exit shall be provided by a fire wall complying with Section 705 or a fire barrier complying with Section 706 and having a fire-resistance rating of not less than 2 hours. Opening protectives in horizontal exit walls shall also comply with Section 715. The horizontal exit separation shall extend vertically through all levels of the building unless floor assemblies have a fire-resistance rating of not less than 2 hours with no unprotected openings.

Exception: A fire-resistance rating is not required at horizontal exits between a building area and an above-grade pedestrian walkway constructed in accordance with Section 3104, provided that the distance between connected buildings is more than 20 feet (6096 mm).

Horizontal exit walls constructed as fire barriers shall be continuous from exterior wall to exterior wall so as to divide completely the floor served by the horizontal exit.

1022.3 Opening protectives. Fire doors in horizontal exits shall be self-closing or automatic-closing when activated by a smoke detector in accordance with Section 715.4.7.3. Doors, where located in a cross-corridor condition, shall be auto-

matic-closing by activation of a smoke detector installed in accordance with Section 715.4.7.3.

1022.4 Capacity of refuge area. The refuge area of a horizontal exit shall be a space occupied by the same tenant or a public area and each such refuge area shall be adequate to accommodate the original occupant load of the refuge area plus the occupant load anticipated from the adjoining compartment. The anticipated occupant load from the adjoining compartment shall be based on the capacity of the horizontal exit doors entering the refuge area. The capacity of the refuge area shall be computed based on a net floor area allowance of 3 square feet (0.2787 m²) for each occupant to be accommodated therein.

Exception: The net floor area allowable per occupant shall be as follows for the indicated occupancies:

1. Six square feet (0.6 m²) per occupant for occupancies in Group I-3.
2. Fifteen square feet (1.4 m²) per occupant for ambulatory occupancies in Group I-2.
3. Thirty square feet (2.8 m²) per occupant for nonambulatory occupancies in Group I-2.

SECTION 1023 EXTERIOR EXIT RAMPS AND STAIRWAYS

1023.1 Exterior exit ramps and stairways. Exterior exit ramps and stairways serving as an element of a required means of egress shall comply with this section.

Exception: Exterior exit ramps and stairways for outdoor stadiums complying with Section 1020.1, Exception 2.

1023.2 Use in a means of egress. Exterior exit ramps and stairways shall not be used as an element of a required means of egress for Group I-2 occupancies. For occupancies in other than Group I-2, exterior exit ramps and stairways shall be permitted as an element of a required means of egress for buildings not exceeding four stories above grade plane or having occupied floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

1023.3 Open side. Exterior exit ramps and stairways serving as an element of a required means of egress shall be not less than 50 percent open on one side. Outside stairs shall be arranged to restrict the accumulation of smoke.

1023.4 Side yards. The open areas adjoining exterior exit ramps or stairways shall be either yards, courts or public ways; the remaining sides are permitted to be enclosed by the exterior walls of the building.

1023.5 Location. Exterior exit ramps and stairways shall be located in accordance with Section 1024.3.

1023.6 Exterior ramps and stairway protection. Exterior exit ramps and stairways shall be separated from the interior of the building as required in Section 1020.1. Openings shall be limited to those necessary for egress from normally occupied spaces.

Exceptions:

1. Separation from the interior of the building is not required for occupancies, other than those in Group

R-1 or R-2, in buildings that are no more than two stories above grade plane where the level of exit discharge is the first story above grade plane.

2. Separation from the interior of the building is not required where the exterior ramp or stairway is served by an exterior ramp and/or balcony that connects two remote exterior stairways or other approved exits with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the openings no less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior ramp or stairway located in a building or structure that is permitted to have unenclosed interior stairways in accordance with Section 1020.1.
4. Separation from the interior of the building is not required for exterior ramps or stairways connected to open-ended corridors, provided that Items 4.1 through 4.4 are met:

4.1. The building, including corridors and ramps and/or stairs, shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

4.2. The open-ended corridors comply with Section 1017.

4.3. The open-ended corridors are connected on each end to an exterior exit ramp or stairway complying with Section 1023.

4.4. At any location in an open-ended corridor where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet (3.3 m²) or an exterior ramp or stairway shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

SECTION 1024 EXIT DISCHARGE

1024.1 General. Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide direct access to grade. The exit discharge shall not reenter a building.

Exceptions:

1. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through areas on the level of discharge provided all of the following are met:
 - 1.1. Such exit enclosures egress to a free and unobstructed way to the exterior of the building, which way is readily visible and identifiable from the point of termination of the exit enclosure.

- 1.2. The entire area of the level of discharge is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure.
 - 1.3. The egress path from the exit enclosure on the level of discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of exits.
2. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through a vestibule provided all of the following are met:
 - 2.1. The entire area of the vestibule is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure.
 - 2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).
 - 2.3. The area is separated from the remainder of the level of exit discharge by construction providing protection at least the equivalent of approved wired glass in steel frames.
 - 2.4. The area is used only for means of egress and exits directly to the outside.
 3. Stairways in open parking garages complying with Section 1020.1, Exception 5, are permitted to egress through the open parking garage at the level of exit discharge.

1024.2 Exit discharge capacity. The capacity of the exit discharge shall be not less than the required discharge capacity of the exits being served.

1024.3 Exit discharge location. Exterior balconies, stairways and ramps shall be located at least 10 feet (3048 mm) from adjacent lot lines and from other buildings on the same lot unless the adjacent building exterior walls and openings are protected in accordance with Section 704 based on fire separation distance.

1024.4 Exit discharge components. Exit discharge components shall be sufficiently open to the exterior so as to minimize the accumulation of smoke and toxic gases.

1024.5 Egress courts. Egress courts serving as a portion of the exit discharge in the means of egress system shall comply with the requirements of Section 1024.

1024.5.1 Width. The width of egress courts shall be determined as specified in Section 1005.1, but such width shall not be less than 44 inches (1118 mm), except as specified herein. Egress courts serving Group R-3 and U occupancies shall not be less than 36 inches (914 mm) in width.

The required width of egress courts shall be unobstructed to a height of 7 feet (2134 mm).

Exception: Doors, when fully opened, and handrails shall not reduce the required width by more than 7 inches (178 mm). Doors in any position shall not reduce the required width by more than one-half. Other nonstructural projections such as trim and similar decorative features are permitted to project into the required width 1.5 inches (38 mm) from each side.

Where an egress court exceeds the minimum required width and the width of such egress court is then reduced along the path of exit travel, the reduction in width shall be gradual. The transition in width shall be affected by a guard not less than 36 inches (914 mm) in height and shall not create an angle of more than 30 degrees (0.52 rad) with respect to the axis of the egress court along the path of egress travel. In no case shall the width of the egress court be less than the required minimum.

1024.5.2 Construction and openings. Where an egress court serving a building or portion thereof is less than 10 feet (3048 mm) in width, the egress court walls shall have not less than 1-hour fire-resistance-rated construction for a distance of 10 feet (3048 mm) above the floor of the court. Openings within such walls shall be protected by opening protectives having a fire protection rating of not less than $\frac{3}{4}$ hour.

Exceptions:

1. Egress courts serving an occupant load of less than 10.
2. Egress courts serving Group R-3.

1024.6 Access to a public way. The exit discharge shall provide a direct and unobstructed access to a public way.

Exception: Where access to a public way cannot be provided, a safe dispersal area shall be provided where all of the following are met:

1. The area shall be of a size to accommodate at least 5 square feet (0.28 m²) for each person.
2. The area shall be located on the same lot at least 50 feet (15 240 mm) away from the building requiring egress.
3. The area shall be permanently maintained and identified as a safe dispersal area.
4. The area shall be provided with a safe and unobstructed path of travel from the building.

SECTION 1025 ASSEMBLY

1025.1 General. Occupancies in Group A which contain seats, tables, displays, equipment or other material shall comply with this section.

1025.1.1 Bleachers. Reserved.

1025.2 Assembly main exit. Every assembly occupancy shall be provided with a main entrance/exit. The minimum aggregate width of the main entrance for Group A occupancies shall

be sufficient to accommodate 50 percent of the occupant load and shall be at the level of exit discharge or shall connect to a stairway or ramp leading to a street. Each level of a Group A occupancy shall have access to a main exit and such access shall have sufficient capacity to accommodate 50 percent of the occupant load of such levels. Where the main exit from an assembly occupancy is through a lobby or foyer, the aggregate capacity of all exits from the lobby or foyer shall be permitted to provide the required capacity of the main exit regardless of whether all such exits serve as entrances to the building.

Exceptions:

1. A bowling establishment shall have a main entrance capable of accommodating 50 percent of the total occupant load regardless of the aisles that the entrance serves.
2. In assembly occupancies where there is no well-defined entrance/exit, exits may be distributed around the perimeter of the building, provided the total exit width furnishes a minimum of 100 percent of the width needed to accommodate the maximum occupant content.

1025.3 Assembly other exits. Each level of an assembly occupancy shall have access to a main exit and shall be provided with additional exits of sufficient width to accommodate one-half of the total occupant load served by that level. Such additional exits shall be located as far from the main entrance/exit as practicable. Such exits shall be accessible from a cross aisle or a side aisle.

Exception: In assembly occupancies where there is no well-defined entrance/exit, exits may be distributed around the perimeter of the building, provided the total exit width furnishes a minimum of 100 percent of the width needed to accommodate the maximum occupant content.

1025.4 Foyers and lobbies. In Group A-1 occupancies, where persons are admitted to the building at times when seats are not available and are allowed to wait in a lobby or similar space, such use of lobby or similar space shall not encroach upon the required clear width of the means of egress. Such waiting areas shall be separated from the required means of egress by substantial permanent partitions or by fixed rigid railings not less than 42 inches (1067 mm) high. Such foyer, if not directly connected to a public street by all the main entrances or exits, shall have a straight and unobstructed corridor or path of travel to every such main entrance or exit.

1025.5 Interior balcony and gallery means of egress. For balconies or galleries having a seating capacity of 50 or more located in Group A occupancies, at least two means of egress shall be provided, with one from each side of every balcony or gallery and at least one leading directly to an exit.

1025.5.1 Enclosure of balcony openings. Interior stairways and other vertical openings shall be enclosed in an exit enclosure as provided in Section 1020.1, except that stairways are permitted to be open between the balcony and the main assembly floor in occupancies such as theaters, places of religious worship and auditoriums. At least one accessible means of egress is required from a balcony or gallery

level containing accessible seating locations in accordance with Section 1007.3 or 1007.4.

1025.6 Width of means of egress for assembly. The clear width of aisles and other means of egress shall comply with Section 1025.6.1 where smoke-protected seating is not provided and with Section 1025.6.2 or 1025.6.3 where smoke-protected seating is provided. The clear width shall be measured to walls, edges of seating and tread edges except for permitted projections.

1025.6.1 Without smoke protection. The clear width of the means of egress shall provide sufficient capacity in accordance with all of the following, as applicable:

1. At least 0.3 inch (7.6 mm) of width for each occupant served shall be provided on stairs having riser heights 7 inches (178 mm) or less and tread depths 11 inches (279 mm) or greater, measured horizontally between tread nosings.
2. At least 0.005 inch (0.127 mm) of additional stair width for each occupant shall be provided for each 0.10 inch (2.5 mm) of riser height above 7 inches (178 mm).
3. Where egress requires stair descent, at least 0.075 inch (1.9 mm) of additional width for each occupant shall be provided on those portions of stair width having no handrail within a horizontal distance of 30 inches (762 mm).
4. Ramped means of egress, where slopes are steeper than one unit vertical in 12 units horizontal (8.333-percent slope), shall have at least 0.22 inch (5.6 mm) of clear width for each occupant served. Level or ramped means of egress, where slopes are not steeper than one unit vertical in 12 units horizontal (8-percent slope), shall have at least 0.20 inch (5.1 mm) of clear width for each occupant served.

1025.6.2 Smoke-protected seating. The clear width of the means of egress for smoke-protected assembly seating shall not be less than the occupant load served by the egress element multiplied by the appropriate factor in Table 1025.6.2. The total number of seats specified shall be those within the space exposed to the same smoke-protected environment. Interpolation is permitted between the specific values shown. A life safety evaluation, complying with NFPA 101 as adopted by *Florida Fire Prevention Code*, shall be done for a facility utilizing the reduced width requirements of Table 1025.6.2 for smoke-protected assembly seating.

Exception: For an outdoor smoke-protected assembly with an occupant load not greater than 18,000, the clear width shall be determined using the factors in Section 1025.6.3.

1025.6.2.1 Smoke control. Means of egress serving a smoke-protected assembly seating area shall be provided with a smoke control system complying with Section 909 or natural ventilation designed to maintain the smoke level at least 6 feet (1829 mm) above the floor of the means of egress.

1025.6.2.2 Roof height. A smoke-protected assembly seating area with a roof shall have the lowest portion of

**TABLE 1025.6.2
WIDTH OF AISLES FOR SMOKE-PROTECTED ASSEMBLY**

TOTAL NUMBER OF SEATS IN THE SMOKE-PROTECTED ASSEMBLY OCCUPANCY	INCHES OF CLEAR WIDTH PER SEAT SERVED			
	Stairs and aisle steps with handrails within 30 inches	Stairs and aisle steps without handrails within 30 inches	Passageways, doorways and ramps not steeper than 1 in 10 in slope	Ramps steeper than 1 in 10 in slope
Equal to or less than 5,000	0.200	0.250	0.150	0.165
10,000	0.130	0.163	0.100	0.110
15,000	0.096	0.120	0.070	0.077
20,000	0.076	0.095	0.056	0.062
Equal to or greater than 25,000	0.060	0.075	0.044	0.048

For SI: 1 inch = 25.4 mm.

the roof deck not less than 15 feet (4572 mm) above the highest aisle or aisle accessway.

Exception: A roof canopy in an outdoor stadium shall be permitted to be less than 15 feet (4572 mm) above the highest aisle or aisle accessway provided that there are no objects less than 80 inches (2032 mm) above the highest aisle or aisle accessway.

1025.6.2.3 Automatic sprinklers. Enclosed areas with walls and ceilings in buildings or structures containing smoke-protected assembly seating shall be protected with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

Exceptions:

1. The floor area used for contests, performances or entertainment provided the roof construction is more than 50 feet (15 240 mm) above the floor level and the use is restricted to low fire hazard uses.
2. Press boxes and storage facilities less than 1,000 square feet (93 m²) in area.
3. Outdoor seating facilities where seating and the means of egress in the seating area are essentially open to the outside.

1025.6.3 Width of means of egress for outdoor smoke-protected assembly. The clear width in inches (mm) of aisles and other means of egress shall be not less than the total occupant load served by the egress element multiplied by 0.08 (2.0 mm) where egress is by aisles and stairs and multiplied by 0.06 (1.52 mm) where egress is by ramps, corridors, tunnels or vomitories.

Exception: The clear width in inches (mm) of aisles and other means of egress shall be permitted to comply with Section 1025.6.2 for the number of seats in the outdoor smoke-protected assembly where Section 1025.6.2 permits less width.

1025.7 Travel distance. Exits and aisles shall be so located that the travel distance to an exit door shall not be greater than 200 feet measured along the line of travel in nonsprinklered buildings. Travel distance shall not be more than 250 feet in sprinklered buildings. Where aisles are provided for seating,

the distance shall be measured along the aisles and aisle accessway without travel over or on the seats.

Exceptions:

1. Smoke-protected assembly seating: The travel distance from each seat to the nearest entrance to a vomitory or concourse shall not exceed 200 feet (60 960 mm). The travel distance from the entrance to the vomitory or concourse to a stair, ramp or walk on the exterior of the building shall not exceed 200 feet (60 960 mm).
2. Open-air seating: The travel distance from each seat to the building exterior shall not exceed 400 feet (122 m). The travel distance shall not be limited in facilities of Type I or II construction.
3. The travel distance within an exhibit booth or exhibit enclosure to an exit access aisle shall not be greater than 50 feet (15 240 mm).

1025.8 Common path of egress travel. A common path of travel shall be permitted for the 20 feet (6096 mm) from any point where serving any number of occupants and for the first 75 feet (22 860 mm) from any point where serving not more than 50 occupants.

Exception:

1. For smoke-protected assembly seating, the common path of travel shall not exceed 50 feet (1524 mm) from any seat to a point where a person has a choice of two directions of egress travel.

1025.8.1 Path through adjacent row. Where one of the two paths of travel is across the aisle through a row of seats to another aisle, there shall be not more than 24 seats between the two aisles, and the minimum clear width between rows for the row between the two aisles shall be 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row between aisles.

Exception: For smoke-protected assembly seating there shall not be more than 40 seats between the two aisles and the minimum clear width shall be 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat.

1025.9 Assembly aisles are required. Every occupied portion of any occupancy in Group A that contains seats, tables, dis-

plays, similar fixtures or equipment shall be provided with aisles leading to exits or exit access doorways in accordance with this section. Aisle accessways for tables and seating shall comply with Section 1014.4.3.

1025.9.1 Minimum aisle width. The minimum clear width for aisles serving seating not at tables shall be as shown:

1. Forty-eight inches (1219 mm) for aisle stairs having seating on each side.
- Exception:** Thirty-six inches (914 mm) where the aisle serves less than 50 seats.
2. Thirty-six inches (914 mm) for aisle stairs having seating on only one side.
3. Twenty-three inches (584 mm) between an aisle stair handrail or guard and seating where the aisle is subdivided by a handrail.
4. Forty-two inches (1067 mm) for level or ramped aisles having seating on both sides.

Exceptions:

1. Thirty-six inches (914 mm) where the aisle serves less than 50 seats.
2. Thirty inches (762 mm) where the aisle does not serve more than 14 seats.
5. Thirty-six inches (914 mm) for level or ramped aisles having seating on only one side.

Exceptions:

1. Thirty inches (762 mm) where the aisle does not serve more than 14 seats.
2. Twenty-three inches (584 mm) between an aisle stair handrail and seating where an aisle does not serve more than five rows on one side.

1025.9.1.1 The minimum width of aisles serving seating at tables shall be 44 inches (1118 mm).

Exception: Thirty-six inches (914 mm) where serving an occupant load of not more than 50.

1025.9.2 Means of egress capacity. The capacity of means of egress shall be in accordance with Section 1005. The width of aisles and other means of egress serving theater-type seating or similar seating arranged in rows shall provide sufficient capacity in accordance with Sections 1024.9.2.1 and 1024.9.2.2.

1025.9.2.1 Minimum clear widths of aisles and other means of egress serving theater-type seating, or similar seating arranged in rows, shall be in accordance with Table 1024.9.2.1.

**TABLE 1025.9.2.1
CAPACITY FACTORS**

NO. OF SEATS	NOMINAL FLOW TIME (sec)	INCH OF CLEAR WIDTH PER SEAT SERVED	
		STAIRS	PASSAGEWAYS, RAMPS, AND DOORWAYS
Unlimited	200	0.300 AB	0.220 C

1025.9.2.2 The minimum clear widths shown in Table 1025.9.2.1 shall be modified in accordance with all of the following:

1. If risers exceed 7 inches (178 mm) in height, multiply the stair width in the table by factor A, where

$$A = 1 + \frac{(\text{riser height} - 7 \text{ inches})}{5}$$

2. Stairs not having a handrail within a 30-inch (762 mm) horizontal distance shall be 25 percent wider than otherwise calculated (i.e., multiply by factor B = 1.25).
3. Ramps steeper than 1:10 slope where used in ascent shall have their width increased by 10 percent (i.e., multiply by factor C = 1.10).

Exceptions:

1. Lighting and access catwalks shall meet the requirements for Group F occupancies.
2. Grandstands, bleachers and folding and telescopic seating as permitted by Section 1024.6.2.

1025.9.2.3 Clear width shall be measured to walls, edges of seating and tread edges except for permitted projections.

1025.9.4 Uniform width. Those portions of aisles, where egress is possible in either of two directions, shall be uniform in required width.

1025.9.5 Assembly aisle termination. Each end of an aisle shall terminate at cross aisle, foyer, doorway, vomitory or concourse having access to an exit.

Exceptions:

1. Dead-end aisles shall not be greater than 20 feet (6096 mm) in length.
2. Dead-end aisles longer than 20 feet (6096 mm) are permitted where seats beyond the 20-foot (6096 mm) dead-end aisle are no more than 24 seats from another aisle, measured along a row of seats having a minimum clear width of 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row.
3. For smoke-protected assembly seating, the dead-end aisle length of vertical aisles shall not exceed a distance of 21 rows.
4. For smoke-protected assembly seating, a longer dead-end aisle is permitted where seats beyond the 21-row dead-end aisle are not more than 40 seats from another aisle, measured along a row of seats having an aisle accessway with a minimum clear width of 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat above seven in the row.

1025.9.6 Assembly aisle obstructions. There shall be no obstructions in the required width of aisles except for handrails as provided in Section 1025.13.

1025.10 Aisle accessways. The aisle accessway between rows of seating shall have a clear width of not less than 12 inches (305 mm), and the minimum width shall be increased in accordance with Sections 1024.10.2 for seating not at tables and Section 1024.10.2.2 for seating at tables. The width of aisle accessways shall be the clear horizontal distance from the back of the row ahead and the nearest projection of the row behind. Where chairs have automatic or self-rising seats that comply with ASTM F 851, the measurement shall be made with seats in the raised position. Where any chair in the row does not have an automatic or self-rising seat, the measurements shall be made with the seat in the down position. For seats with folding tablet arms, row spacing shall be determined with the tablet in the useable position.

Exception: When not more than four persons are served, there shall be no minimum clear width requirement for the portion of the aisle accessway having a length not exceeding 6 feet (1829 mm) measured from the center of the seat farthest from the aisle.

1025.10.1 Dual access. Reserved.

1025.10.2 Single access. For rows of seating not at tables served by aisles or doorways at both ends there shall be no more than 100 seats per row and the 12 inches (305 mm) minimum clear width of aisle accessways shall be increased by 0.3 inch (7.6 mm) for every additional seat beyond 14, but the minimum clear width shall not be required to exceed 22 inches (559 mm).

Exception: For smoke-protected assembly seating, the row length limits for a 12-inch-wide (305 mm) aisle accessway, beyond which the aisle accessway minimum clear width shall be increased, are in Table 1025.10.2.

1025.10.2.1 For rows of seating not at tables served by an aisle or doorway at one end only, the 12 inches (305 mm) minimum clear width of aisle accessways shall be increased by 0.6 inch (15.2 mm) for every additional seat beyond seven, but the minimum clear width shall not be required to exceed 22 inches (559 mm).

Exception: For smoke-protected assembly seating, the row length limits for a 12-inch-wide (305 mm) aisle accessway, beyond which the aisle accessway minimum clear width shall be increased, are in Table 1025.10.2.

**TABLE 1025.10.2
SMOKE-PROTECTED
ASSEMBLY AISLE ACCESSWAYS**

TOTAL NUMBER OF SEATS IN THE SMOKE-PROTECTED ASSEMBLY OCCUPANCY	MAXIMUM NUMBER OF SEATS PER ROW PERMITTED TO HAVE A MINIMUM 12-INCH CLEAR WIDTH AISLE ACCESSWAY	
	Aisle or doorway at both ends of row	Aisle or doorway at one end of row only
Less than 4,000	14	7
4,000	15	7
7,000	16	8
10,000	17	8
13,000	18	9
16,000	19	9
19,000	20	10
22,000 and greater	21	11

For SI: 1 inch = 25.4 mm.

1025.10.2.1.2 For rows of seating not at tables served by an aisle or doorway on one end only, the path of travel shall not exceed 30 feet (9144 mm) from any seat to a point where a person has a choice of two paths of travel to two exits.

1025.10.2.2 Aisle accessways serving seating at tables shall have a minimum clear width of 12 inches (305 mm).

1025.10.2.2.1 Where nonfixed seating is located between a table and an aisle accessway, the measurement of required clear width of the aisle accessway shall be made to a line 19 inches (483 mm) away from the edge of the table. The 19-inch (483 mm) distance shall be measured perpendicularly to the edge of the table.

1025.10.2.2.2 The minimum 12-inch (305 mm) width required for an aisle accessway shall be increased by 0.5 inch (13 mm) for each additional 12 inches (305 mm) or fraction thereof beyond 12 feet (3658 mm) of aisle accessway length where measured from the center of the seat farthest from an aisle.

1025.10.2.2.3 The path of travel along the aisle accessway shall not exceed 36 feet (10 973 mm) from any seat to the closest aisle or egress doorway.

1025.11 Assembly aisle walking surfaces. Aisles with a slope not exceeding one unit vertical in eight units horizontal (12.5-percent slope) shall consist of a ramp having a slip-resistant walking surface. Aisles with a slope exceeding one unit vertical in eight units horizontal (12.5-percent slope) shall consist of a series of risers and treads that extends across the full width of aisles and complies with Sections 1025.11.1 through 1025.11.3.

1025.11.1 Treads. Tread depths shall be a minimum of 11 inches (279 mm) and shall have dimensional uniformity.

Exception: The tolerance between adjacent treads shall not exceed 0.188 inch (4.8 mm).

1025.11.2 Risers. Where the gradient of aisle stairs is to be the same as the gradient of adjoining seating areas, the riser height shall not be less than 4 inches (102 mm) nor more

than 8 inches (203 mm) and shall be uniform within each flight.

Exceptions:

1. The riser height of aisle stairs in folding and telescopic seating shall be permitted to be not less than 3½ inches (89 mm) and shall not exceed 11 inches (279 mm).
2. Riser heights not exceeding 9 inches (229 mm) shall be permitted where they are necessitated by the slope of the adjacent seating areas to maintain sightlines.

1025.11.3 Tread contrasting marking stripe. A contrasting marking stripe shall be provided on each tread at the nosing or leading edge such that the location of each tread is readily apparent when viewed in descent. Such stripe shall be a minimum of 1 inch (25 mm), and a maximum of 2 inches (51 mm), wide.

Exception: The contrasting marking stripe is permitted to be omitted where tread surfaces are such that the location of each tread is readily apparent when viewed in descent.

1025.12 Seat stability. In places of assembly, the seats shall be securely fastened to the floor.

Exceptions:

1. In places of assembly or portions thereof without ramped or tiered floors for seating and with 200 or fewer seats, the seats shall not be required to be fastened to the floor.
2. In places of assembly or portions thereof with seating at tables and without ramped or tiered floors for seating, the seats shall not be required to be fastened to the floor.
3. In places of assembly or portions thereof without ramped or tiered floors for seating and with greater than 200 seats, the seats shall be fastened together in groups of not less than three or the seats shall be securely fastened to the floor.
4. In places of assembly where flexibility of the seating arrangement is an integral part of the design and function of the space and seating is on tiered levels, a maximum of 200 seats shall not be required to be fastened to the floor. Plans showing seating, tiers and aisles shall be submitted for approval.
5. Groups of seats within a place of assembly separated from other seating by railings, guards, partial height walls or similar barriers with level floors and having no more than 14 seats per group shall not be required to be fastened to the floor.
6. Seats intended for musicians or other performers and separated by railings, guards, partial height walls or similar barriers shall not be required to be fastened to the floor.
7. Restaurants, cafeterias, cafeteriums, gymnasiums, gymnasium and similar multipurpose assembly occupancies.

8. Movable seating in rows with seats fastened together in groups of not less than three nor more than seven.
9. Seats in balconies, galleries, railed in enclosures, boxes or loges with level floor surfaces and having occupant loads not exceeding 14.
10. Assembly occupancies in accordance with Exception 1 or 3 shall not have more than one seat for 15 square feet (1.4 m²) of net floor area and shall provide adequate aisles to reach exits.

1025.13 Handrails. Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and aisle stairs shall be provided with handrails located either at the side or within the aisle width. Handrails shall not be required where otherwise permitted by the following:

1. Handrails shall not be required for ramped aisles having a gradient not steeper than 1:8 and having seating on both sides where the aisle does not serve as an accessible route.
2. The requirement for a handrail shall be satisfied by the use of a guard provided with a rail that complies with the graspability requirements for handrails and located at a consistent height between 34 inches and 42 inches (865 mm and 1065 mm), measured using one of the following methods:
 - 2.1. Vertically from the top of the rail to the leading edge (nosing) of stair treads.
 - 2.2. Vertically from the top of the rail to the adjacent walking surface in the case of a ramp.

1025.13.1 Discontinuous handrails. Where there is seating on both sides of the aisle, the handrails shall be discontinuous with gaps or breaks at intervals not exceeding five rows to facilitate access to seating and to permit crossing from one side of the aisle to the other. These gaps or breaks shall have a clear width of at least 22 inches (559 mm) and not greater than 36 inches (914 mm), measured horizontally, and the handrail shall have rounded terminations or bends.

1025.13.2 Intermediate handrails. Where handrails are provided in the middle of aisle stairs, there shall be an additional intermediate handrail located approximately 12 inches (305 mm) below the main handrail.

1025.14 Assembly guards. Assembly guards shall comply with Sections 1025.14.1 through 1025.14.3.

1025.14.1 Cross aisles. Cross aisles located more than 30 inches (762 mm) above the floor or grade below shall have guards in accordance with Section 1013.

Where an elevation change of 30 inches (762 mm) or less occurs between a cross aisle and the adjacent floor or grade below, guards not less than 26 inches (660 mm) above the aisle floor shall be provided.

Exception: Where the backs of seats on the front of the cross aisle project 24 inches (610 mm) or more above the adjacent floor of the aisle, a guard need not be provided.

1025.14.2 Sightline-constrained guard heights. Unless subject to the requirements of Section 1025.14.3, a fascia or railing system in accordance with the guard requirements of

Section 1013 and having a minimum height of 26 inches (660 mm) shall be provided where the floor or footboard elevation is more than 30 inches (762 mm) above the floor or grade below and the fascia or railing would otherwise interfere with the sightlines of immediately adjacent seating. At bleachers, a guard must be provided where the floor or footboard elevation is more than 24 inches (610 mm) above the floor or grade below and the fascia or railing would otherwise interfere with the sightlines of the immediately adjacent seating.

1025.14.3 Guards at the end of aisles. A fascia or railing system complying with the guard requirements of Section 1013 shall be provided for the full width of the aisle where the foot of the aisle is more than 30 inches (762 mm) above the floor or grade below. The fascia or railing shall be a minimum of 36 inches (914 mm) high and shall provide a minimum 42 inches (1067 mm) measured diagonally between the top of the rail and the nosing of the nearest tread.

1025.15 Bench seating. Where bench seating is used, the number of persons shall be based on one person for each 18 inches (457 mm) of length of the bench.

SECTION 1026 EMERGENCY ESCAPE AND RESCUE

1026.1 General. In addition to the means of egress required by this chapter, provisions shall be made for emergency escape and rescue in Group R and I-1 occupancies. Basements and sleeping rooms below the fourth story above grade plane shall have at least one exterior emergency escape and rescue opening in accordance with this section. Where basements contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Such openings shall open directly into a public way or to a yard or court that opens to a public way. The emergency escape and rescue opening shall be permitted to open into a screen enclosure, open to the atmosphere, where a screen door is provided leading away from the residence. Such opening shall be operational from the inside without the use of special knowledge, keys or tools.

Exceptions:

1. In other than Group R-3 occupancies, buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. In other than Group R-3 occupancies, sleeping rooms provided with a door to a fire-resistance-rated corridor having access to two remote exits in opposite directions.
3. The emergency escape and rescue opening is permitted to open onto a balcony within an atrium in accordance with the requirements of Section 404, provided the balcony provides access to an exit and the dwelling unit or sleeping unit has a means of egress that is not open to the atrium.

4. Basements with a ceiling height of less than 80 inches (2032 mm) shall not be required to have emergency escape and rescue windows.
5. High-rise buildings in accordance with Section 403.
6. Emergency escape and rescue openings are not required from basements or sleeping rooms that have an exit door or exit access door that opens directly into a public way or to a yard, court or exterior exit balcony that opens to a public way.
7. Basements without habitable spaces and having no more than 200 square feet (18.6m²) in floor area shall not be required to have emergency escape windows.
8. Security and hurricane devices installed in accordance with Section 1008.1.3.6.

1026.2 Minimum size. Emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet (0.53 m²).

Exception: The minimum net clear opening for emergency escape and rescue grade-floor openings shall be 5 square feet (0.46 m²).

1026.2.1 Minimum dimensions. The minimum net clear opening height dimension shall be 24 inches (610 mm). The minimum net clear opening width dimension shall be 20 inches (508 mm). The net clear opening dimensions shall be the result of normal operation of the opening.

1026.3 Maximum height from floor. Emergency escape and rescue openings shall have the bottom of the clear opening not greater than 44 inches (1118 mm) measured from the floor.

1026.4 Operational constraints. Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools. Bars, grilles, grates or similar devices are permitted to be placed over emergency escape and rescue openings provided the minimum net clear opening size complies with Section 1026.2 and such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the escape and rescue opening. See Section 1008.1.3.6 for provisions related to hurricane protection devices. Where such bars, grilles, grates or similar devices are installed in existing buildings, smoke alarms shall be installed in accordance with Section 907.2.10 regardless of the valuation of the alteration.

1026.4.1 Every room or space greater than 250 square feet (23.2 m²) in educational occupancies used for classroom or other educational purposes or normally subject to student occupancy and every room or space normally subject to client occupancy, other than bathrooms, in Group D occupancies shall have not less than one outside window for emergency rescue that complies with the following:

1. Such windows shall be openable from the inside without the use of tools and shall provide a clear opening of not less than 20 inches (508 mm) in width, 24 inches (610 mm) in height, and 5.7 square feet (0.53 m²) in area.
2. The bottom of the opening shall be not more than 44 inches (1118 mm) above the floor, and any latching

device shall be capable of being operated from not more than 54 inches (1372 mm) above the finished floor.

1026.5 Window wells. An emergency escape and rescue opening with a finished sill height below the adjacent ground level shall be provided with a window well in accordance with Sections 1026.5.1 and 1026.5.2.

1026.5.1 Minimum size. The minimum horizontal area of the window well shall be 9 square feet (0.84 m²), with a minimum dimension of 36 inches (914 mm). The area of the window well shall allow the emergency escape and rescue opening to be fully opened.

1026.5.2 Ladders or steps. Window wells with a vertical depth of more than 44 inches (1118 mm) shall be equipped with an approved permanently affixed ladder or steps. Ladders or rungs shall have an inside width of at least 12 inches (305 mm), shall project at least 3 inches (76 mm) from the wall and shall be spaced not more than 18 inches (457 mm) on center (o.c.) vertically for the full height of the window well. The ladder or steps shall not encroach into the required dimensions of the window well by more than 6 inches (152 mm). The ladder or steps shall not be obstructed by the emergency escape and rescue opening. Ladders or steps required by this section are exempt from the stairway requirements of Section 1009.

SECTION 1027 BUSINESS

1027.1 Doors. Egress doors shall conform to the requirements of Section 1008, except doors serving office areas with an occupant load of 10 or less need not be side-swinging type.

1027.2 Handrails and guardrails. Handrails and guardrails shall be in accordance with Sections 1009.11 and 1012.

Exception: In areas not accessible to the public and in fully enclosed stairways in office buildings not serving a Group A, E or R occupancy, the clear distance between rails or ornamental pattern shall be such as to prevent the passage of a 21-inch (533 mm) diameter sphere.

1027.3 Stairs. Spiral stairs complying with Section 1009.9 shall be permitted as a component in a means of egress.

1027.4 Common path of travel. In Group B buildings which are sprinklered throughout, a common path of travel not exceeding 100 feet (30 480 mm) shall be permitted.

SECTION 1028 EDUCATIONAL

1028.1 Exterior corridors or balconies.

1028.1.1 A corridor roofed over and enclosed on its long sides and open to the atmosphere at the ends may be considered an exterior corridor provided:

1. Clear story openings not less than one-half the height of the corridor walls are provided on both sides of the corridor and above adjacent roofs or buildings, or

2. The corridor roof has unobstructed openings to the sky with the open area not less than 50 percent of the area of the roof. Openings shall be equally distributed with any louvers fixed open. The clear area of openings with fixed louvers shall be based on the actual openings between louver vanes.

1028.1.2 The minimum width of such corridors shall be sufficient to accommodate the occupant load but shall in no case be less than 6 feet (1829 mm).

1028.2 Panic and fire exit hardware.

1028.2.1 Each door in a means of egress from an area of Group E occupancy having an occupant load of 100 or more may be provided with a latch or lock only if it is panic hardware or fire exit hardware, which releases when a force of no more than 15 pounds (67 N) is applied to the releasing devices in the direction of exit travel. Such releasing devices may be bars or panels extending not less than one-half the width of the door and placed at heights suitable for the service required, but not less than 34 inches (864 mm) nor more than 48 inches (1219 mm) above the floor. Whenever panic hardware is used on a labeled fire door, the panic hardware shall be labeled as fire exit hardware.

1028.2.2 If balanced doors are used and panic hardware is required, the panic hardware shall be of the pushpad type and the pad shall not extend more than one-half the width of the door measured from the latch side.

1028.3 Doors that swing into an exit access corridor shall be recessed to prevent interference with corridor traffic; any doors not recessed shall open 180 degrees (3.1 rad) to stop against the wall. Doors in any position shall not reduce the required corridor width by more than one-half.

SECTION 1029 FACTORY-INDUSTRIAL

1029.1 Handrails and guardrails. Handrails and guardrails shall be installed in accordance with Sections 1009.11 and 1012.

Exception: In areas not accessible to the public in Group F, the clear distance between rails or ornamental pattern shall be such as to prevent the passage of a 21-inch (533 mm) diameter sphere.

1029.2 Stairs. Spiral stairs complying with Section 1009.9 shall be permitted as a component in a means of egress.

1029.3 Common path of travel. Common paths of travel in Group F, special purpose occupancies shall not exceed 50 feet (15 240 mm).

Exception: In Group F buildings, which are sprinklered throughout, a common path of travel not exceeding 100 feet (30 486 mm) shall be permitted.

SECTION 1030 INSTITUTIONAL

1030.1 Locks. Patient rooms or tenant space egress doors in Group I occupancies shall not be lockable.

Exceptions:

1. In places of restraint or detention.
2. Door locking arrangements without delayed egress shall be permitted in Groups I-1 and I-2, or portions of such occupancies, where the clinical needs of the patients require specialized security measures for their safety, provided that staff can readily unlock such doors at all times.
3. Key locking devices that restrict access from the corridor and that are operable only by staff from the corridor side shall be permitted. Such devices shall not restrict egress from the room.

1030.2 Arrangement of means of egress.

1030.2.1 Every habitable room shall have an exit access door leading directly to an exit access corridor.

Exceptions:

1. If there is an exit door opening directly to the outside from the room at ground level.
2. Patient sleeping rooms shall be permitted to have one intervening room if the intervening room is not used as an exit access for more than eight patient sleeping beds.
3. Special nursing suites shall be permitted to have one intervening room where the arrangement allows for direct and constant visual supervision by nursing personnel.
4. For rooms other than patient sleeping rooms, one or more adjacent rooms shall be permitted to intervene in accordance with Section 1030.8.

1030.3 Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (93 m²) shall have at least two exit access doors remotely located from each other.

1030.4 Any room or any suite of rooms, other than patient sleeping rooms, of more than 2,500 square feet (230 m²) shall have at least two exit access doors remotely located from each other.

1030.5 Any suite of rooms that complies with the requirements of Section 1030.3 shall be permitted to be subdivided with nonfire-rated, noncombustible or limited-combustible partitions.

1030.6 Suites of sleeping rooms shall not exceed 5,000 square feet (460 m²).

1030.7 Suites of rooms, other than patient sleeping rooms, shall not exceed 10,000 square feet (930 m²).

1030.8 Suites of rooms, other than patient sleeping rooms, shall be permitted to have one intervening room if the travel distance within the suite to the exit access door is not greater than 100 feet (30 480 mm) and shall be permitted to have two intervening rooms where the travel distance within the suite to the exit access door is not greater than 50 feet (15 240 mm).

1030.9 Every corridor shall provide access to at least two approved exits without passing through any intervening rooms or spaces other than corridors or lobbies.

1030.10 Every exit or exit access shall be arranged so that no corridor, aisle or passageway has a pocket or dead end exceeding 20 feet (6096 mm).

1030.11 Travel distance.

1030.11.1 Travel distance shall not exceed that specified in Table 1015.1.

1030.11.2 Travel distance shall comply with Section 1030.11.2.1 through 1030.11.2.4.

1030.11.2.1 The travel distance between any room door required as an exit access and an exit shall not exceed 150 feet (45 720 mm).

1030.11.2.2 The travel distance between any point in a room and an exit shall not exceed 200 feet (60 960 mm).

1030.11.2.3 The travel distance between any point in a health care sleeping room and an exit access door in that room shall not exceed 50 feet (15 240 mm).

1030.11.2.4 The travel distance between any point in a suite of sleeping rooms as permitted by Section 1030.2 and an exit access door of that suite shall not exceed 100 feet (30 480 mm) and shall meet the requirements of Section 1030.11.2.2.

1030.12 Measurement of travel distance to exits. Travel distance shall be determined in accordance with Section 1015, but shall not exceed:

1. One-hundred feet (30 480 mm) between any room door required as exit access and an exit.
2. One-hundred-and-fifty feet (45 720 mm) between any point in a room and an exit.
3. Fifty feet (15 240 mm) between any point in a sleeping room and the door of that room.

Exceptions:

1. The travel distance above may be increased by 50 feet (15 240 mm) in rooms other than sleeping rooms when the building is protected throughout by an approved automatic sprinkler system or smoke control system.
2. The maximum permitted travel distance shall be increased to 100 feet (30 480 mm) in sprinklered or unsprinklered open dormitories where the enclosing walls of the dormitory space are of smoketight construction. Where travel distance to the exit access door from any point within the dormitory exceeds 50 feet (15 240 mm), a minimum of two exit access doors remotely located from each other shall be provided.

1030.13 Stairs.

1030.13.1 Spiral stairs meeting the requirements of Section 1009.9 are permitted for access to and between staff locations.

1030.13.2 Alternating tread stairways meeting the requirements of Section 1009.10 are permitted for access to and between staff locations subject to occupancy by no more

than three persons all capable of using the alternating tread stairway.

1030.13.3 Solid risers, intermediate handrails, latticework or similar facilities required by Sections 1009.3.2 and 1012.3 which would interfere with visual supervision of residents are not required.

SECTION 1031 MERCANTILE

1031.1 Stairs. Spiral stairs complying with Section 1009.9 shall be permitted as a component in a means of egress.

1031.2 Handrails and guardrails. Handrails and guardrails shall be installed in accordance with Sections 1009.11 and 1012.

Exception: In areas not accessible to the public and in fully enclosed stairways in Group M not serving a Group A, E or R occupancy, the clear distance between rails or ornamental pattern shall be such as to prevent the passage of a 21-inch (533 mm) diameter sphere.

1031.3 Common path of travel. In Group M buildings which are sprinklered throughout, a common path of travel not exceeding 100 feet (30 480 mm) shall be permitted.

SECTION 1032 RESIDENTIAL

1032.1 Stairways not part of the required means of egress and providing access from the outside grade level to the basement in Group R-3 occupancies shall be exempt from Section 1009 when the maximum height from the basement finished floor level to grade adjacent to the stair does not exceed 8 feet (2438 mm) and the grade level opening to the stair is covered by hinged doors or other approved means.

1032.2 Common path of travel. In Group R-1 and R-2 occupancies no common path of travel shall exceed 35 feet (10 668 mm). Travel within a guest room, guest suite or dwelling unit shall not be included when calculating common path of travel.

Exception: In buildings protected throughout by an approved, automatic sprinkler system a common path of travel shall not exceed 50 feet (15 240 mm).

1032.3 Travel distance in group R1 and R2 occupancies. In group R-1 and R-2 occupancies travel distance within a guest room, guest suite or dwelling unit to a corridor door shall not exceed 75 feet (22 860 mm) and allowed to be increased to 125 feet when the building is protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 903.3.1.1.

SECTION 1033 STORAGE

1033.1 Aircraft servicing hangars.

1033.1.1 Exits from aircraft servicing areas shall be provided at intervals of not more than 150 feet (45 720 mm) on all exterior walls. There shall be a minimum of two means of egress from each aircraft servicing area. Horizontal exits

through interior fire walls shall be provided at intervals of not more than 100 feet (30 480 mm) along the wall.

Exception: Dwarf or “smash” doors in doors used for accommodating aircraft shall be permitted for compliance with these requirements.

1033.1.2 Means of egress from mezzanine floors in aircraft servicing areas shall be arranged so that the maximum travel distance to reach the nearest exit from any point on the mezzanine shall not exceed 75 feet (23 m). Such means of egress shall lead directly to a properly enclosed stair discharging directly to the exterior, to a suitable cutoff area or to outside stairs.

1033.2 Stairs. Spiral stairs complying with Section 1009.9 shall be permitted as a component in a means of egress.

1033.3 Handrails and guardrails. Handrails and guardrails shall be installed in accordance with Sections 1009.11 and 1012.

Exception: In areas not accessible to the public in Group S, the clear distance between rails or ornamental pattern shall be such as to prevent the passage of a 21-inch (533 mm) diameter sphere.

1033.4 Common path of travel.

1033.4.1 In Group S-1 storage, occupancies common path of travel shall not exceed 50 feet (15 240 mm).

Exception: Common paths of travel shall not exceed 100 feet (30 480 mm) in buildings protected by an approved automatic sprinkler system.

1033.4.2 In Group S-2 storage, occupancies common paths of travel shall not be limited.

1033.4.3 A common path of travel for the first 50 feet (15 240 mm) from any point shall be permitted in parking structures.

SECTION 1034 DAY CARE

1034.1 Panic and fire exit hardware.

1034.1.1 Any door in a required means of egress from an area having an occupant load of 100 or more persons shall be permitted to be provided with a latch or lock only if it is panic hardware or fire exit hardware which releases when a force of no more than 15 pounds (67 N) is applied to the releasing devices in the direction of exit travel. Such releasing devices may be bars or panels extending not less than one-half the width of the door and placed at heights suitable for the service required, but not less than 34 inches (864 mm) nor more than 48 inches (1219 mm) above the floor. Whenever panic hardware is used on a labeled fire door, the panic hardware shall be labeled as fire exit hardware.

1034.1.2 If balanced doors are used and panic hardware is required, the panic hardware shall be of the push-pad type and the pad shall not extend more than one-half the width of the door measured from the latch side.

1034.2 Doors and corridors.

1034.2.1 Every room or space with an occupant load of more than 50 persons or an area of more than 1,000 square feet (93 m²) shall have at least two exit access doorways as remotely located from each other as practicable. Such doorways shall provide access to separate exits, but where egress is through corridors, they shall be permitted to open onto a common corridor leading to separate exits located in opposite directions.

1034.2.2 Where the two exit accesses from a day care occupancy in an apartment building enter the same corridor as the apartment occupancy, the exit accesses shall be separated in the corridor by a smoke barrier having not less than a 1-hour fire-resistance rating constructed in accordance with Section 709. The smoke barrier shall be located so that it has an exit on each side.

1034.2.3 Doors designed to be normally closed shall comply with Section 715.3.7.

1034.3 A travel distance of 200 feet (60 960 mm) in unsprinklered buildings and 250 feet (76 200 mm) in buildings protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the following.

1. The travel distance between any room door intended as an exit access and an exit shall not exceed 100 feet (30 480 mm); and
2. The travel distance between any point in a room and an exit shall not exceed 150 feet (45 720 mm); and
3. The travel distance between any point in a sleeping room and an exit access door in that room shall not exceed 50 feet (15 240 mm).

Exception: The travel distance in Items 1 and 2 above may be increased by 50 feet (15 240 mm) in buildings protected throughout by an approved supervised automatic sprinkler system.

1034.4 Illumination and marking of means of egress. Illumination and marking of means of egress shall comply with Section 1006.

1034.5 Emergency lighting. Emergency lighting in accordance with Section 1006.2 shall be provided in the following areas:

1. Interior stairs and corridors.
2. Normally occupied spaces.

Exception: Administrative areas, general classrooms, mechanical rooms and storage areas.

3. Flexible and open plan buildings.
4. Interior or windowless portions of buildings.
5. Shops and laboratories.

1034.6 Special means of egress features. Every room or space normally subject to client occupancy, other than bathrooms, shall have at least one outside window for emergency rescue and ventilation. Such window shall be openable from the inside without the use of tools and shall provide a clear opening of not less than 20 inches (508 mm) in width, 24 inches (610 mm) in height, and 5.7 square feet (0.53 m²) in area. The bottom of the

opening shall be not more than 44 inches (1118 mm) above the floor. The clear opening shall permit a rectangular solid, with a minimum width and height that provides the required 5.7 square foot (0.53 m²) opening and a minimum depth of 20 inches (8 mm), to pass fully through the opening.

Exceptions:

1. In buildings protected throughout by an approved, automatic sprinkler system.
2. Where the room or space has a door leading directly to the outside of the building.

1034.7 Flexible plan and open plan buildings. In day care occupancies, each room occupied by more than 300 persons shall have two or more means of egress entering into separate atmospheres. If three or more means of egress are required, not more than two of them shall enter into a common atmosphere.

1034.8 Group day care homes means of escape requirements.

1034.8.1 The provisions of Chapter 10 shall be applicable to means of escape in day care homes except as modified in this section.

1034.8.2 In group day care homes, every story occupied by clients shall have not less than two remotely located means of escape. Maximum travel distance shall be as specified in Section 1034.3.

1034.8.3 In group day care homes, every room used for sleeping, living or dining purposes shall have at least two means of escape, at least one of which shall be a door or stairway that provides a means of unobstructed travel to the outside of the building at street or ground level. The second means of escape may be a window in accordance with Section 1034.6. No room or space that is accessible only by a ladder or folding stairs or through a trap door shall be occupied for living or sleeping purposes.

1034.8.4 In group day care homes where spaces on the story above the story of exit discharge are used by clients, at least one means of escape shall be an exit discharging directly to the outside. The second means of escape may be a window in accordance with Section 1034.6.

1034.8.5 In group day care homes where clients occupy a story below the level of exit discharge, at least one means of escape shall be an exit discharging directly to the outside. The second means of escape may be a window in accordance with Section 1034.6. No facility shall be located more than one story below the ground. In day care homes, any stairway to the story above shall be cut off by a fire barrier containing a door that has at least a 20-minute fire protection rating and is equipped with a self-closing device.

1034.8.6 In group day care homes, every room or space normally subject to client occupancy, other than bathrooms, shall have at least one outside window for emergency rescue and ventilation complying with Section 1034.6.

Exceptions:

1. In buildings protected throughout by an approved, automatic sprinkler system.

2. Where the room or space has a door leading directly to the outside of the building.

1034.8.7 Where the two exit accesses from a group day care home in an apartment building enter the same corridor as the apartment occupancy, the exit accesses shall be separated in the corridor by a smoke barrier having not less than a 1-hour fire-resistance rating constructed in accordance with Section 709. The smoke barrier shall be located so that it has an exit on each side.

SECTION 1035 BOILER, FURNACE AND MECHANICAL EQUIPMENT ROOMS

1035.1 Single means of egress. Stories used exclusively for boilers, furnaces or mechanical equipment shall be permitted to have a single means of egress where the travel distance to an exit on that story does not exceed the common path of travel stipulated in Section 1035.2.

1035.2 Common path of travel. Boiler rooms, furnace rooms, mechanical equipment rooms and similar spaces shall have a common path of travel not exceeding 50 feet (15 240 mm).

Exceptions:

1. In buildings protected throughout with an approved automatic sprinkler system boiler rooms, furnace rooms, mechanical equipment rooms and similar spaces shall be permitted to have a common path of travel not exceeding 100 feet (30 480 mm).
2. Mechanical equipment rooms with no fuel-fired equipment shall be permitted to have a common path of travel not exceeding 100 feet (30 480 mm).

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CHAPTER 11

FLORIDA ACCESSIBILITY CODE FOR BUILDING CONSTRUCTION
PART A

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FLO RIDA BUILDING CODE

FINAL DRAFT

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INTRODUCTION

In 1993 the Florida Legislature enacted the “Florida Americans with Disability Accessibility Implementation Act.” The purpose and intent of this Act (Sections 553.501-553.513, *Florida Statutes*) is to incorporate into the laws of Florida the accessibility requirements of the Americans with Disabilities Act of 1990, Public Law No. 101-336, 42 U.S.C. Section 12101 et. seq. ADA, while at the same time to maintain those provisions of Florida law that are more stringent than the ADA accessibility guidelines, that is, those provisions which are more favorable to the needs of the disabled. In 1997 the legislature amended the Act to complete the move to establish consistency of the Florida accessibility building code to the Federal ADA Accessibility Guidelines as adopted by the Department of Justice at 28 CFR part 36, Appendix A. Nothing in Section 553.501-553.513 is intended to expand or diminish the defenses available to a place of public accommodation under the Americans with Disabilities Act and the federal Americans with Disabilities Act Accessibility Guidelines, including, but not limited to, the readily achievable standard, and the standards applicable to alterations to places of public accommodation.

Accessibility is a multifaceted issue within the issues of life today. The legislative actions of the 101st Congress which implemented the Americans with Disabilities Act of 1990 and previous acts of the Florida Legislature have been combined in the following pages to reflect accessibility laws as they relate to most areas of construction in Florida. Areas of employment as related to accessibility and/or complaints would be the responsibility of the **Equal Employment Opportunity Commission, 1-800-669-4000 or 305-536-4491.**

Primarily because of the complexities of balancing the rights of the physically disabled and the technically specific requirements of the built environment, no single agency has been charged with enforcement of all issues pertaining to accessibility. The following is a listing of agencies and their statutory areas of responsibility for accessibility. A thorough attempt was made by the Department of Community Affairs at the time of publication of this document to ensure that this manual is a reflection of the laws of Florida and the administrative rules of each agency as these requirements relate to construction. Because individual agency rules may change, it is the responsibility of the design professional and the property owner to ensure compliance with subsequent revisions.

RESPONSIBLE AGENCIES

For issues pertaining to:

1. H.U.D. Office of Fair Housing and Equal Opportunity Hot Line

Washington, D.C.
Voice: 1-800-669-9777

TTY: 1-800-927-9275
FAX: 1-202-708-1425

www.hud.gov
Atlanta, GA

Voice: 1-404-331-4149

Forms and Publications

1-800-767-7468

Florida State Offices

Jacksonville

Voice: 1-904-232-2627

FAX: 1-904-232-3759

Miami

Voice: 1-305-536-4456

FAX: 1-305-536-5765

TTY: 1-305-536-4734

Orlando

Voice: 1-407-648-6441

FAX: 1-407-648-6310

Tampa

Voice: 1-813-228-2026

FAX: 1-813-228-2431

TTY: 1-813-228-2115

Florida Commission on Human Relations

Voice: 1-850-488-7082

Voice Message Service:

1-800-342-8170

TDD ASCII 1-800-955-1339

TDD Baudot 1-800-955-8771

Voice Relay Service:

1-800-955-8770

fchr.state.fl.us

2. Public Telephone Installation and Placement

Florida Public Service Commission

Voice: 1-800-342-3552

Fax: 1-850-511-0809

TDD: 1-800-955-8771

www.floridapsc.com

3. Government Parking Facilities Traffic Operations Office

Florida Department of Transportation

Voice: 1-866-374-3368, ext. 5253

FAX: 1-850-414-5251

TDD: 1-850-921-0762

4. Accessible Parking Placards: Department of Highway Safety and Motor Vehicles

Contact your local Tax Collector's Office. Contact numbers listed by county at:

www.hsmv.state.fl.us/offices/

5. Elevator Accessibility: Department of Business Regulation

Bureau of Elevator Inspection

Automated Call System:

1-850-487-1395, select Hotels & Restaurants, then Elevators

www.state.fl.us/dbpr/hr/elevators

6. Government Facilities (Standards for Design)

Department of Management Services

Division of Building Construction

Permits and Inspections

Voice: 1-850-488-2856

FAX: 1-850-487-9947

fcn.state.fl.us/dms/dbc/

7. Hospital and Health Care Facilities

Agency for Health Care Administration

Office of Plans and Construction

Voice: 1-850-487-0713

FAX: 1-850-922-6483

www.fdhc.state.fl.us/MCHQ/plans/

8. Public Schools and State Universities

Florida Department of Education

www.fldoe.org

Educational Facilities

Voice: 1-850-245-0494

Fax: 1-850-245-9236

www.firn.edu/doe/edfacil/

Board of Trustees

www.fldoe.org/trusteesLinks.asp

9. State Prisons

Department of Corrections Facilities Services

Voice: 1-850-487-1330

www.dc.state.fl.us

10. ADA Questions and Complaints United States Department of Justice

Voice: 1-800-514-0301

TTY/TDD: 1-800-514-0383

www.usdoj.gov/disabilities.htm

11. Florida Accessibility and Waiver Questions

Codes and Standards

Department of Community Affairs

Voice: 1-850-487-1824

FAX: 1-850-414-8436

www.dca.state.fl.us

12. Historic Preservation Office of Cultural and Historical Resources

Division of Historical Resources

Voice: 1-850-245-6372

FAX: 1-850-245-6437

dhr.dos.state.fl.us/preservation

13. Code Compliance and Enforcement Local Building Departments

553.513 Enforcement. It shall be the responsibility of each local government and each code enforcement agency established pursuant to Section 553.80 to enforce the provisions of this part. This act expressly preempts the establishment of handicapped accessibility standards to the state and supersedes any county or municipal ordinance on the subject. However, nothing in this section shall prohibit municipalities and counties from enforcing the provisions of this act.

History.—s. 6, ch. 89-97; s. 2, ch. 93-183.

Note.—Former s. 553.495.

Department of Community Affairs

553.75(3) The department shall be responsible for the provision of administrative and staff-support services relating to the functions of the board with respect to matters within the jurisdiction of the board, the department shall be responsible for the implementation and faithful discharge of all decisions of the board made pursuant to its authority under the provisions of this part (Sections 553.501 through 553.513, *Florida Statute*) (see Section 553.506, *Florida Statutes*).

Florida Building Commission

553.506 Powers of the commission. In addition to any other authority vested in the Florida Building Commission by law, the commission, in implementing Sections 553.501 through 553.513, may, by rule, adopt revised and updated versions of the Americans with Disabilities Act Accessibility Guidelines in accordance with Chapter 120.

553.512 Modifications and waivers; advisory council. The Florida Building Commission shall provide by regulation criteria for granting individual modifications of, or exceptions from, the literal requirements of this part upon a determination of unnecessary, unreasonable, or extreme hardship, provided such waivers shall not violate federal accessibility laws and regulations and shall be reviewed by the Accessibility Advisory Council. (see Section 553.512, *Florida Statutes*).

(1) Notwithstanding any other provision of this subsection if an applicant for a waiver demonstrates economic hardship in accordance with 28 C.F.R. s. 36.403(f)(1), a waiver shall be granted. The commission may not consider waiving any of the requirements of Section 553.5041 unless the applicant first demonstrates that he or she has applied for and been denied waiver or variance from all local government zoning, subdivision regulations, or other ordinances that prevent compliance therewith. Further, the commission may not waive the requirement of Section 553.5041(5)(a) and (c)1 governing the minimum width of accessible routes and minimum width of accessible parking spaces.

(2) The Accessibility Advisory Council shall consist of the following seven members, who shall be knowledgeable in the area of accessibility for persons with disabilities. The secretary of community affairs shall appoint the following: a representative from the Advocacy Center for Persons with Disabilities, Inc.; a representative from the Division of Blind Services; a representative from the Division of Vocational Rehabilitation; a representative from a statewide organization representing the physically handicapped; a representative from the hearing impaired; a representative from the president, Florida Council of Handicapped Organizations; and a representative of the Paralyzed Veterans of America. The terms for the first three council members appointed subsequent to October 1, 1991, shall be four years; the terms for the next two council members appointed shall be for three years; and the terms for the next two members shall be for two years. Thereafter, all council member appointments shall be for terms of four years. No council member shall serve more than two four-year terms subsequent to October 1, 1991. Any member of the council may be replaced by the secretary upon three unexcused absences. Upon application made in the form provided, an individual waiver or modification may be granted by the commission so long as such modification or waiver is not in conflict with more stringent standards provided in another chapter.

(3) Members of the council shall serve without compensation, but shall be entitled to reimbursement for per diem and travel expenses as provided by Section 112.061.

(4) Meetings of the advisory council shall be held in conjunction with the regular meetings of the commission.

History.—s. 3, ch. 78-333; s. 1, ch. 82-46; s. 2, ch. 83-265; s. 25, ch. 86-220; s. 5, ch. 89-97; ss. 1, 5, 6, ch. 91-172; s. 5, ch. 91-429; s. 2, ch. 93-183; s. 10, ch. 97-76; s. 68, ch. 2000-141; s. 61, ch. 2000-154; s. 13, ch. 2002-293.

Note.—Former s. 553.49.

Criteria for reviewing applications for waivers are established by Rule 9B-7, Florida Administration Code.

General Note

If an official either waives an accessible element or feature or allows a change that does not provide equivalent facilitation, the fact that Department of Justice has certified the code itself will not constitute rebuttable evidence that the facility has been constructed or altered in accordance with the minimum accessibility requirements of the ADA.

The text enclosed in shaded boxes indicates changes to the ADA Accessibility Guidelines (ADAAG). Changes are based on requirements established by Florida law and requirements established by 28 CFR 36 Subpart A and D.

SECTION 11-1 PURPOSE

11-1.1 This code shall take effect October 1, 1997.

11-1.2 All new or altered buildings and facilities subject to this code which may be frequented in, lived in, or worked in by the public shall comply with this code.

11-1.3 This code establishes standards for accessibility to places of public accommodation and commercial facilities by individuals with disabilities. This code shall also apply: to state and local government facilities pursuant to Section 553.503, *Florida Statutes*; to private clubs pursuant to Section 553.505, *Florida Statutes*; and to residential buildings pursuant to section 553.504(2), *Florida Statutes*. It is to be applied during the design, construction, and alteration of such buildings and facilities as required by Section 553.501 through 553.512, *Florida Statutes*.

SECTION 11-2 GENERAL

11-2.1 Provisions for adults. The specifications in this code are based upon adult dimensions and anthropometrics.

11-2.2 Equivalent facilitation. Departures from particular technical and scoping requirements of this code by the use of other designs and technologies are permitted where the alternative designs and technologies used will provide substantially equivalent or greater access to and usability of the facility.

Departure from the explicit technical and scoping requirements of this code for any element voids any otherwise applicable presumption of rebuttable evidence that the element has been constructed or altered in accordance with the minimum accessibility requirements of the ADA.

SECTION 11-3 MISCELLANEOUS INSTRUCTIONS AND DEFINITIONS

11-3.1 Graphic conventions. Graphic conventions are shown in Table 1. Dimensions that are not marked minimum or maximum are absolute, unless otherwise indicated in the text or captions.

11-3.2 Dimensional tolerances. All dimensions are subject to conventional building industry tolerances for field conditions.

11-3.3 Notes. Reserved.

11-3.4 General terminology.

Comply with. Meet one or more specifications of the code.

If, if...then. Denotes a specification that applies only when the conditions described are present.

May. Denotes an option or alternative.

Shall. Denotes a mandatory specification or requirement.

Should. Denotes an advisory specification or recommendation.

11-3.5 Definitions.

ACCESS AISLE. An accessible pedestrian space between elements, such as parking spaces, seating, and desks, that provides clearances appropriate for use of the elements.

ACCESSIBLE. A site, building, facility, or portion thereof that complies with these guidelines.

ACCESSIBLE ELEMENT. An element specified by these guidelines (for example, telephone, controls and the like).

ACCESSIBLE ROUTE. A continuous unobstructed path connecting all accessible elements and spaces of a building or facility. Interior accessible routes may include corridors, floors, ramps, elevators, lifts, and clear floor space at fixtures. Exterior accessible routes may include parking access aisles, curb ramps, crosswalks at vehicular ways, walks, ramps and lifts.

ACCESSIBLE SPACE. Space that complies with these guidelines.

ADAPTABILITY. The ability of certain building spaces and elements, such as kitchen counters, sinks and grab bars, to be added or altered so as to accommodate the needs of individuals with or without disabilities or to accommodate the needs of persons with different types or degrees of disability.

ADDITION. An expansion, extension, or increase in the gross floor area of a building or facility.

ADMINISTRATIVE AUTHORITY. A governmental agency that adopts or enforces regulations and guidelines for the design, construction, or alteration of buildings and facilities.

ALTERATION. A change to a building or facility made by, on behalf of, or for the use of a public accommodation or commercial facility, that affects or could affect the usability of the building or facility or part thereof. Alterations include, but are not limited to, remodeling, renovation, rehabilitation, reconstruction, historic restoration, changes or rearrangement of the structural parts or elements, and changes or rearrangement in the plan configuration of walls and full-height partitions. Normal maintenance, reroofing, painting or wall-papering, or changes to mechanical and electrical systems are not alterations unless they affect the usability of the building or facility.

AREA OF RESCUE ASSISTANCE. An area, which has direct access to an exit, where people who are unable to use stairs may remain temporarily in safety to await further instructions or assistance during emergency evacuation.

ASSEMBLY AREA. A room or space accommodating a group of individuals for recreational, educational, political, social, or amusement purposes, or for the consumption of food and drink.

AUTOMATIC DOOR. A door equipped with a power-operated mechanism and controls that open and close the door automatically upon receipt of a momentary actuating signal. The switch that begins the automatic cycle may be a photoelectric device, floor mat, or manual switch (see “Power-assisted door”).

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

CIRCULATION PATH. An exterior or interior way of passage from one place to another for pedestrians, including, but not limited to, walks, hallways, courtyards, stairways and stair landings.

CLEAR. Unobstructed.

CLEAR FLOOR SPACE. The minimum unobstructed floor or ground space required to accommodate a single, stationary wheelchair and occupant.

CLOSED CIRCUIT TELEPHONE. A telephone with dedicated line(s) such as a house phone, courtesy phone or phone that must be used to gain entrance to a facility.

COMMERCE. Commerce means travel, trade, traffic, commerce, transportation, or communication:

- (1) Among the several states;
- (2) Between any foreign country or any territory or possession and any state; or
- (3) Between points in the same state but through another state or foreign country.

COMMERCIAL FACILITIES. Commercial facilities means facilities

- (1) Whose operations will affect commerce;
- (2) That are intended for nonresidential use by a private entity; and
- (3) That are not:
 - (a) Facilities that are not covered or expressly exempted from coverage under the Fair Housing Act of 1968, as amended (42 U.S.C. 3601-3631);
 - (b) Aircraft; or
 - (c) Railroad locomotives, railroad freight cars, railroad cabooses, commuter or intercity passenger rail cars (including coaches, dining cars, sleeping cars, lounge cars, and food service cars), and any other railroad cars described in Section 242 of the ADA or covered under Title II of the ADA, or railroad rights-of-way. For purposes of this definition, “rail” and “railroad” have the meaning given the term “railroad” in Section 202(e) of the Federal Railroad Safety Act of 1970 [45 U.S.C. 431(e)].

COMMON USE. Those interior and exterior rooms, spaces, or elements that are made available for the use of a restricted group of people (for example, occupants of a homeless shelter, the occupants of an office building, or the guests of such occupants).

CROSS SLOPE. The slope that is perpendicular to the direction of travel (see running slope).

CURB RAMP. A short ramp cutting through a curb or built up to it.

DETECTABLE WARNING. A standardized surface feature built in or applied to walking surfaces or other elements to warn visually impaired people of hazards on a circulation path.

DISABILITY. With respect to an individual, a physical or mental impairment that substantially limits one or more of the major life activities of such individual; a record of such an impairment; or being regarded as having such an impairment.

(1) The phrase physical or mental impairment means:

(a) Any physiological disorder or condition, cosmetic disfigurement, or an anatomical loss affecting one or more of the following body systems; neurological; musculoskeletal; special sense organs; respiratory, including speech organs; cardiovascular; reproductive; digestive; genitourinary; hemic and lymphatic; skin; and endocrine;

(b) Any mental or psychological disorder such as mental retardation, organic brain syndrome, emotional or mental illness, and specific learning disabilities;

(c) The phrase physical or mental impairment includes, but is not limited to, such contagious and noncontagious diseases and conditions as orthopedic, visual, speech, and hearing impairments, cerebral palsy, epilepsy, muscular dystrophy, multiple sclerosis, cancer, heart disease, diabetes, mental retardation, emotional illness, specific learning disabilities, HIV disease (whether symptomatic or asymptomatic), tuberculosis, drug addiction, and alcoholism;

(d) The phrase physical or mental impairment does not include homosexuality or bisexuality.

(2) The phrase major life activities means functions such as caring for one’s self, performing manual tasks, walking, seeing, hearing, speaking, breathing, learning and working.

(3) The phrase has a record of such an impairment means has a history of, or has been misclassified as having, a mental or physical impairment that substantially limits one or more major life activities.

(4) The phrase is regarded as having an impairment means:

(a) Has a physical or mental impairment that does not substantially limit major life activities but that is treated by a private entity as constituting such a limitation;

(b) Has a physical or mental impairment that substantially limits major life activities only as a result of the attitudes of others toward such impairment; or

(c) Has not of the impairments defined in paragraph (1) of this definition but is treated by a private entity as having such an impairment.

(5) The term “disability” does not include:

- (a) Transvestism, transsexualism, pedophilia, exhibitionism, voyeurism, gender identity disorders not resulting from physical impairments, or other sexual behavior disorders;
- (b) Compulsive gambling, kleptomania or pyromania; or
- (c) Psychoactive substance use disorders resulting from current illegal use of drugs.

DWELLING UNIT. A single unit which provides a kitchen or food preparation area, in addition to rooms and spaces for living, bathing, sleeping, and the like. Dwelling units include a single-family home or a townhouse used as a transient group home; an apartment building used as a shelter; guestrooms in a hotel that provide sleeping accommodations and food preparation areas; and other similar facilities used on a transient basis. For purposes of this code, use of the term “dwelling unit” does not imply the unit is used as a residence.

EGRESS, MEANS OF. A continuous and unobstructed way of exit travel from any point in a building or facility to a public way. A means of egress comprises vertical and horizontal travel and may include intervening room spaces, doorways, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, horizontal exits, courts and yards. An accessible means of egress is one that complies with this code and does not include stairs, steps, or escalators. Areas of rescue assistance or evacuation elevators may be included as part of accessible means of egress.

ELEMENT. An architectural or mechanical component of a building, facility, space, or site, e.g., telephone, curb ramp, door, drinking fountain, seating, or water closet.

ENTRANCE. Any access point to a building or portion of a building or facility used for the purpose of entering. An entrance includes the approach walk, the vertical access leading to the entrance platform, the entrance platform itself, vestibules if provided, the entry door(s) or gate(s), and the hardware of the entry door(s) or gate(s).

FACILITY. All or any portion of buildings, structures, site improvements, complexes, equipment, roads, walks, passageways, parking lots or other real or personal property located on a site.

GROUND FLOOR. Any occupiable floor less than one story above or below grade with direct access to grade. A building or facility always has at least one ground floor and may have more than one ground floor as where a split level entrance has been provided or where a building is built into a hillside.

MEZZANINE OR MEZZANINE FLOOR. That portion of a story which is an intermediate floor level placed within the story and having occupiable space above and below its floor.

MARKED CROSSING. A crosswalk or other identified path intended for pedestrian use in crossing a vehicular way.

MULTIPLE-FAMILY DWELLING. Any building containing more than two dwelling units.

OCCUPIABLE. 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, light, and ventilation.

OPERABLE PART. A part of a piece of equipment or appliance used to insert or withdraw objects, or to activate, deactivate, or adjust the equipment or appliance (for example, coin slot, push-button, handle).

PATH OF TRAVEL.

- (1) A path of travel includes a continuous, unobstructed way of pedestrian passage by means of which the altered area may be approached, entered, and exited, and which connects the altered area with an exterior approach (including sidewalks, streets, and parking areas), an entrance to the facility, and other parts of the facility.
- (2) An accessible path of travel may consist of walks and sidewalks, curb ramps and other interior or exterior pedestrian ramps; clear floor paths through lobbies, corridors, rooms, and other improved areas; parking access aisles; elevators and lifts; or a combination of these elements.
- (3) For the purposes of this part (Section 553.501 through 553.512, *Florida Statutes*), the term “path of travel” also includes the restrooms, telephones, and drinking fountains serving the altered area.

POWER-ASSISTED DOOR. A door used for human passage with a mechanism that helps to open the door, or relieves the opening resistance of a door, upon the activation of a switch or a continued force applied to the door itself.

PLACE OF PUBLIC ACCOMMODATION. A facility, operated by a private entity, whose operations affect commerce and fall within at least one of the following categories:

- 1. Places of lodging. An inn, hotel, motel, or other place of lodging, except for an establishment located within a building that contains not more than five rooms for rent or hire and that is actually occupied by the proprietor of the establishment as the residence of the proprietor. Resort condominiums are considered to be public lodging establishments pursuant to Section 509.242, *Florida Statutes*;
- 2. Establishments serving food and drink. A restaurant, bar, or other establishment serving food or drink;
- 3. Places of exhibition or entertainment. A motion picture house, theater, concert hall, stadium, or other place of exhibition or entertainment;
- 4. Places of public gathering. An auditorium, convention center, lecture hall, or other place of public gathering;
- 5. Sales or rental establishments. A bakery, grocery store, clothing store, hardware store, shopping center, or other sales or rental establishment;
- 6. Service establishments. A laundromat, dry-cleaner, bank, barber shop, beauty shop, travel service, shoe repair service, funeral parlor, gas station, office of an accountant or lawyer, pharmacy, insurance office,

professional office of a health care provider, hospital, or other service establishment;

7. Stations used for specified public transportation. A terminal, depot, or other station used for specified public transportation;
8. Places of public display or collection. A museum, library, gallery, or other place of public display or collection;
9. Places of recreation. A park, zoo, amusement park, or other place of recreation;
10. Places of education. A nursery, elementary, secondary, undergraduate, or postgraduate private school, or other place of education;
11. Social service center establishments. A day care center, senior citizen center, homeless shelter, food bank, adoption agency, or other social service center establishment;
12. Places of exercise or recreation. A gymnasium, health spa, bowling alley, golf course, or other place of exercise or recreation;

PRIMARY FUNCTION. A major activity for which the facility is intended. Areas that contain a primary function include, but are not limited to, offices and other work areas in which the activities of the public accommodation or other private entity using the facility are carried out. Mechanical rooms, boiler rooms, supply storage rooms, employee lounges or locker rooms, janitorial closets, entrances, corridors, and restrooms are not areas containing a primary function.

Alterations to an area containing a primary function:

- (1) Alterations that affect the usability of or access to an area containing a primary function include, but are not limited to:
 - (a) Remodeling merchandise display areas or employee work areas in a department store;
 - (b) Replacing an inaccessible floor surface in the customer service or employee work areas of a bank;
 - (c) Redesigning the assembly line area of a factory; or
 - (d) Installing a computer center in an accounting firm.
- (2) For the purposes of this section, alterations to windows, hardware, controls, electrical outlets, and signage shall not be deemed to be alterations that affect the usability of or access to an area containing a primary function.

PROFESSIONAL OFFICE OF A HEALTH CARE PROVIDER. A location where a person or entity, regulated by a state to provide professional services related to the physical or mental health of an individual, makes such services available to the public. The facility housing the “professional office of a health care provider” only includes floor levels housing at least one health care provider, or any floor level designed or intended for use by at least one health care provider.

PUBLIC USE. Interior or exterior rooms or spaces that are made available to the general public. Public use may be pro-

vided at a building or facility that is privately or publicly owned.

RAMP. A walking surface which has a running slope greater than 1:20.

READILY ACHIEVABLE. Readily achievable means easily accomplishable and able to be carried out without much difficulty or expense. In determining whether an action is readily achievable factors to be considered include—

- (1) The nature and cost of the action needed under this part (Section 553.501 through 553.512, *Florida Statutes*);
- (2) The overall financial resources of the site or sites involved in the action; the number of persons employed at the site; the effect on expenses and resources; legitimate safety requirements that are necessary for safe operation, including crime prevention measures; or the impact otherwise of the action upon the operation of the site;
- (3) The geographic separateness, and the administrative or fiscal relationship of the site or sites in question to any parent corporation or entity;
- (4) If applicable, the overall financial resources of any parent corporation or entity; the overall size of the parent corporation or entity with respect to the number of its employees; the number, type, and location of its facilities; and
- (5) If applicable, the type of operation or operations of any parent corporation or entity, including the composition, structure, and functions of the workforce of the parent corporation or entity.

RESORT CONDOMINIUM. A resort condominium is any unit or group of units in a condominium, cooperative, or time-share plan which is rented more than three times a calendar year for periods of less than 30 days or one calendar month, whichever is less, or which is advertised or held out to the public as a place regularly rented for periods of less than 30 days or one calendar month, whichever is less.

RUNNING SLOPE. The slope that is parallel to the direction of travel (see “Cross slope”).

SERVICE ENTRANCE. An entrance intended primarily for delivery of goods or services.

SHOPPING CENTER or SHOPPING MALL.

- (1) A building housing five or more sales or rental establishments; or
- (2) A series of buildings on a common site, either under common ownership or common control or developed either as one project or as a series of related projects, housing five or more sales or rental establishments. For purposes of this section, places of public accommodation of the types listed in Paragraph (5) of the definition of “Place of public accommodation” in this code are considered sales or rental establishments. The facility housing a “shopping center or shopping mall” only includes floor levels housing at least one sales or rental establishment, or any floor level designed or intended for use by at least one sales or rental establishment.

SIGNAGE. Displayed verbal, symbolic, tactile, and pictorial information.

SITE. A parcel of land bounded by a property line or a designated portion of a public right-of-way.

SITE IMPROVEMENT. Landscaping, paving for pedestrian and vehicular ways, outdoor lighting, recreational facilities, and the like, added to a site.

SLEEPING ACCOMMODATIONS. Rooms in which people sleep; for example, dormitory and hotel or motel guest rooms or suites.

SPACE. A definable area, e.g., room, toilet room, hall, assembly area, entrance, storage room, alcove, courtyard, or lobby.

STORY. That portion of a building included between the upper surface of a floor and upper surface of the floor or roof next above. If such portion of a building does not include occupiable space, it is not considered a story for purposes of this code. There may be more than one floor level within a story as in the case of a mezzanine or mezzanines.

STRUCTURAL FRAME. The structural frame shall be considered to be the columns and the girders, beams, trusses and spandrels having direct connections to the columns and all other members which are essential to the stability of the building as a whole.

TACTILE. An object that can be perceived using the sense of touch.

TEXT TELEPHONE. Machinery or equipment that employs interactive graphic (i.e., typed) communications through the transmission of coded signals across the standard telephone network. Text telephones can include, for example, devices known as TDDs (telecommunication display devices or telecommunication devices for deaf persons) or computers.

THEME PARK OR ENTERTAINMENT COMPLEX. (Section 509.0013(9), *Florida Statutes*). Theme park or entertainment complex means a complex comprised of at least 25 contiguous acres owned and controlled by the same business entity and which contains permanent exhibitions and a variety of recreational activities and has a minimum of 1 million visitors annually.

TRANSIENT LODGING. A building, facility, or portion thereof, excluding inpatient medical care facilities, that contains one or more dwelling units or sleeping accommodations. Transient lodging may include, but is not limited to, resorts, group homes, hotels, motels, and dormitories.

VEHICULAR WAY. A route intended for vehicular traffic, such as a street, driveway, or parking lot.

WALK. An exterior pathway with a prepared surface intended for pedestrian use, including general pedestrian areas such as plazas and courts.

SECTION 11-4 ACCESSIBLE ELEMENTS AND SPACES: SCOPE AND TECHNICAL REQUIREMENTS

11-4.1 Minimum requirements.

11-4.1.1 Application.

(1) General. This code establishes the minimum standards for the accessibility of buildings and facilities built or altered within the state.

(a) All areas of newly designed or newly constructed buildings and facilities required to be accessible by Section 11-4.1.2 and Section 11-4.1.3 and altered portions of existing buildings and facilities required to be accessible by Section 11-4.1.6 shall comply with this code, Section 11-4.1 through Section 11-4.35, unless otherwise provided in this section or as modified in a special application section.

(b) Removal of architectural barriers from buildings, structures, or facilities shall comply with Section 11-4.1.8 of this code unless compliance would render the removal not readily achievable. In no instance shall the removal of an architectural barrier create a significant risk to the health or safety of an individual with a disability or others.

(c) New single-family houses, duplexes, triplexes, condominiums, and townhouses shall comply with Section 11-11 of this code.

(2) Application based on building use. Special application Section 11-5 through Section 11-12 provide additional requirements for restaurants and cafeterias, medical care facilities, business and mercantile, libraries, accessible transient lodging, transportation facilities, residential buildings and theme park entertainment complexes. When a building or facility contains more than one use covered by a special application section, each portion shall comply with the requirements for that use.

(3) Areas used only by employees as work areas. Areas that are used only as work areas shall be designed and constructed so that individuals with disabilities can approach, enter, and exit the areas. This code does not require that any areas used only as work areas be constructed to permit maneuvering within the work area or be constructed or equipped (i.e., with racks or shelves) to be accessible.

(4) Temporary structures. This code covers temporary buildings or facilities as well as permanent facilities. Temporary buildings and facilities are not of permanent construction but are extensively used or are essential for public use for a period of time. Examples of temporary buildings or facilities covered by this code includes, but are not limited to: reviewing stands, temporary classrooms, bleacher areas, exhibit areas, temporary banking facilities, temporary health screening services, or temporary safe pedestrian passageways around a construction site. Structures, sites and equipment directly associated with the actual processes of construction, such as scaffolding, bridging, materials hoists, or construction trailers are not included.

(5) General exceptions.

(a) In new construction, a person or entity is not required to meet fully the requirements of this code where that person or entity can demonstrate that it is structurally impracticable to do so. Full compliance will be considered structurally impracticable only in those rare circumstances when the unique characteristics of terrain prevent the incorporation of accessibility features. If full compliance with the requirements of this code is structurally impracticable, a person or entity shall comply with the requirements to the extent it is not structurally impracticable. Any portion of the building or facility which can be made accessible shall comply to the extent that it is not structurally impracticable.

If providing accessibility in conformance with this section to individuals with certain disabilities (e.g., those who use wheelchairs) would be structurally impracticable, accessibility shall nonetheless be ensured to persons with other types of disabilities (e.g., those who use crutches or who have sight, hearing, or mental impairments) in accordance with this section.

(b) Accessibility is not required in nonoccupiable spaces accessed only by ladders, catwalks, crawl spaces, very narrow passageways, or freight (nonpassenger) elevators, and frequented only by service personnel for repair purposes; such spaces include, but are not limited to, elevator pits, elevator penthouses, piping or equipment catwalks.

(c) This edition of the code does not apply to buildings, structures or facilities which were either under construction or under contract for construction on or before October 1, 1997.

11-4.1.2 Accessible site and exterior facilities: new construction.

This edition of the code does not apply to buildings, structures, or facilities which were either under construction or under contract for construction on October 1, 1997.

Nothing in this code shall be construed to relieve the owner of any building, structure or facility from the duty to provide vertical accessibility to all levels above and below the occupiable grade level, regardless of whether the code requires an elevator to be installed in such building, structure or facility, except: (1) elevator pits, elevator penthouses, mechanical rooms, piping or equipment catwalks, and automobile lubrication and maintenance pits and platforms; (2) unoccupiable spaces, such as rooms, enclosed spaces, and storage spaces that are not designed for human occupancy, for public accommodations, or for work areas; and (3) occupiable spaces and rooms that are not open to the public and that house no more than five persons including, but not limited to, equipment control rooms and projection booths. However as provided in Section 553.509, *Florida Statutes*, buildings, structures, and facilities must, at a minimum, comply with the requirements of the ADAAG. Therefore, facilities subject to the ADAAG may be required to

provide vertical access to areas otherwise exempt under Section 11-4.1.3(5) of this code.

An accessible site shall meet the following minimum requirements:

- (1)** At least one accessible route complying with Section 11-4.3 shall be provided within the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones if provided, and public streets or sidewalks, to an accessible building entrance.
- (2)** At least one accessible route complying with Section 11-4.3 shall connect accessible buildings, accessible facilities, accessible elements, and accessible spaces that are on the same site.
- (3)** All objects that protrude from surfaces or posts into circulation paths shall comply with Section 11-4.4.
- (4)** Ground surfaces along accessible routes and in accessible spaces shall comply with Section 11-4.5.

(5) Parking spaces:

(a) If parking spaces are provided for self-parking by employees or visitors, or both, then accessible spaces complying with Section 11-4.6 shall be provided in each such parking area. Such spaces shall be designed and marked for exclusive use of those individuals who have a severe physical disability and have permanent or temporary mobility problems that substantially impair their ability to ambulate and who have been issued either a disabled parking permit under Section 316.1958 or 320.0848, *Florida Statutes*, or a license plate under Section 320.084, 320.0842, 320.0843, or 320.0845, *Florida Statutes*. The number of accessible parking spaces shall comply with the table below and the following:

Total Parking in Lot	Required Minimum Number of Accessible Spaces
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2% of total
1001 and over	20 plus 1 for each 100 over 1000

- (i)** One space in the immediate vicinity of a publicly owned or leased building which houses a governmental entity or a political subdivision, including, but not limited to, state office buildings and courthouses; if no parking for the public is provided on the premises of the building;
- (ii)** One space for each 150 metered on-street parking spaces provided by state agencies and political subdivisions.

(iii) The number of parking spaces for disabled persons shall be increased on the basis of demonstrated and documented need.

(b) In parking structures, one in every eight accessible spaces, but not less than one, shall be “van accessible” and shall be designed as required by Section 11-4.6.3. The vertical clearance at such spaces shall comply with Section 11-4.6.5. All such spaces may be grouped on one level of a parking structure. When such spaces are provided in a parking structure and only one in eight meet the height requirement of Section 11-4.6.5, they shall be designated as required by Section 11-4.6.4.

(c) If passenger loading zones are provided, then at least one passenger loading zone shall comply with Section 11-4.6.6.

(d) At facilities providing medical care and other services for persons with mobility impairments, parking spaces complying with Section 11-4.6 shall be provided in accordance with Section 11-4.1.2(5)(a) except as follows:

(i) Outpatient units and facilities: 10 percent of the total number of parking spaces provided serving each such outpatient unit or facility;

(ii) Units and facilities that specialize in treatment or services for persons with mobility impairments; 20 percent of the total number of parking spaces provided serving each such unit or facility.

(e) **Valet parking.** Valet parking facilities shall provide a passenger loading zone complying with Section 11-4.6.6 located on an accessible route to the entrance of the facility. Section 11-4.1.2(5)(a), Section 11-4.1.2(5)(b), and Section 11-4.1.2(5)(d) of this section do not apply to valet parking facilities.

(f) State agencies and political subdivisions having jurisdiction over street parking, or publicly owned or operated parking facilities are not required to provide a greater right-of-way width than would otherwise be planned under regulations, guidelines, or practices normally applied to new development.

(g) Theme park (see Section 12).

(6) If toilet facilities are provided on a site, then each such public or common use toilet facility shall comply with Section 11-4.22. If bathing facilities are provided on a site, then each such public or common use bathing facility shall comply with Section 11-4.23.

For single user portable toilet or bathing units clustered at a single location, at least 5 percent but no less than one toilet unit or bathing unit complying with Section 11-4.22 or 11-4.23 shall be installed at each cluster whenever typical inaccessible units are provided. Accessible units shall be identified by the International Symbol of Accessibility.

Exception: Portable toilet units at construction sites used exclusively by construction personnel are not required to comply with Section 11-4.1.2(6).

(7) **Building signage.** Signs which designate permanent rooms and spaces shall comply with Sections 11-4.30.1, 11-4.30.4, 11-4.30.5 and 11-4.30.6. Other signs which provide direction to, or information about, functional spaces of the building shall comply with Sections 11-4.30.1, 11-4.30.2, 11-4.30.3, and 11-4.30.5. Elements and spaces of accessible facilities which shall be identified by the International Symbol of Accessibility and which shall comply with Section 11-4.30.7 are:

(a) Parking spaces designated as reserved for individuals with disabilities;

(b) Accessible passenger loading zones;

(c) Accessible entrances when not all are accessible (inaccessible entrances shall have directional signage to indicate the route to the nearest accessible entrance);

(d) Accessible toilet and bathing facilities when not all are accessible.

11-4.1.3 Accessible buildings: new construction.

This edition of the code does not apply to buildings, structures, or facilities which were either under construction or under contract for construction on (or before) October 1, 1997.

(1) At least one accessible route complying with Section 11-4.3 shall connect accessible building or facility entrances with all accessible spaces and elements within the building or facility.

(2) All objects that overhang or protrude into circulation paths shall comply with Section 11-4.4.

(3) Ground and floor surfaces along accessible routes and in accessible rooms and spaces shall comply with Section 11-4.5.

(4) Interior and exterior stairs connecting levels that are not connected by an elevator, ramp, or other accessible means of vertical access shall comply with Section 11-4.9.

(5) One passenger elevator complying with Section 11-4.10 shall serve each level, including mezzanines, in all multistory buildings and facilities unless exempted below. If more than one elevator is provided, each full passenger elevator shall comply with Section 11-4.10.

Vertical accessibility shall be provided to all levels above and below the occupiable grade level, regardless of whether the code requires an elevator to be installed in such building, structure or facility, except for: (1) elevator pits, elevator penthouses, mechanical rooms, piping or equipment catwalks, and automobile lubrication and maintenance pits and platforms; (2) unoccupiable spaces, such as rooms, enclosed spaces, and storage spaces that are not designed for human occupancy, for public accommodations, or for work areas; and (3) occupiable spaces and rooms that are not open to the public and that house no more than five persons including, but not limited to, equipment control rooms and projection booths. However, as provided in Section 553.509, *Florida Statutes*, buildings, struc-

tures, and facilities must, at a minimum, comply with the requirements of ADAAG. Therefore, facilities subject to the ADA may be required to provide vertical access to areas otherwise exempt under Section 11-4.1.3(5)(3) of the code.

Exception 1: Elevators are not required in facilities that are less than three stories or that have less than 3,000 square feet (279 m²) per story unless the building is a shopping center, a shopping mall, or the professional office of a health care provider, or another type of facility as determined by the U.S. Attorney General. The elevator exemption set forth in this paragraph does not obviate or limit in any way the obligation to comply with the other accessibility requirements established in Section 11-4.1.3. For example, floors above or below the accessible ground floor must meet the requirements of this section except for elevator service. If toilet or bathing facilities are provided on a level not served by an elevator, then a toilet or bathing facility must be provided on the accessible ground floor. In new construction if a building or facility is eligible for this exemption but a full passenger elevator is nonetheless planned, that elevator shall meet the requirements of Section 11-4.10 and shall serve each level in the building. A full passenger elevator that provides service from a garage to only one level of a building or facility is not required to serve other levels.

Exception 2: Elevator pits, elevator penthouses, mechanical rooms, piping or equipment catwalks are exempted from this requirement.

Exception 3: Accessible ramps complying with Section 11-4.8 may be used in lieu of an elevator.

Exception 4: Platform lifts (wheelchair lifts) complying with Section 11-4.11 of this code may be used in lieu of an elevator where this section would require an elevator only under the following conditions:

- (a) To provide an accessible route to a performing area in an assembly occupancy.
- (b) To comply with the wheelchair viewing position line-of-sight and dispersion requirements of Section 11-4.33.3.
- (c) To provide access to incidental occupiable spaces and rooms which are not open to the general public and which house no more than five persons, including but not limited to equipment control rooms and projection booths.
- (d) To provide access where existing site constraints or other constraints make use of a ramp or an elevator infeasible.

(6) Windows. Reserved.

(7) Doors.

- (a) At each accessible entrance to a building or facility, at least one door shall comply with Section 11-4.13.
- (b) Within a building or facility, at least one door at each accessible space shall comply with Section 11-4.13.
- (c) Each door that is an element of an accessible route shall comply with Section 11-4.13.

(d) Each door required by Section 11-4.3.10, Egress, shall comply with Section 11-4.13.

(8) In new construction, at a minimum, the requirements in Section 11-4.1.3(8)(a) and Section 11-4.1.3(8)(b) below shall be satisfied independently:

(a)(i) At least 50 percent of all public entrances [excluding those in Section 11-4.1.3(8)(b) below] must be accessible. At least one must be a ground-floor entrance. Public entrances are any entrances that are not loading or service entrances.

(ii) Accessible entrances must be provided in a number at least equivalent to the number of exits required by the applicable building/fire codes. (This paragraph does not require an increase in the total number of entrances planned for a facility.)

(iii) An accessible entrance must be provided to each tenancy in a facility (for example, individual stores in a strip shopping center).

One entrance may be considered as meeting more than one of the requirements in Section 11-4.1.3(8)(a). Where feasible, accessible entrances shall be the entrances used by the majority of people visiting or working in the building.

(b)(i) In addition, if direct access is provided for pedestrians from an enclosed parking garage to the building, at least one direct entrance from the garage to the building must be accessible.

(ii) If access is provided for pedestrians from a pedestrian tunnel or elevated walkway, one entrance to the building from each tunnel or walkway must be accessible.

One entrance may be considered as meeting more than one of the requirements in Section 11-4.1.3(8)(b).

Because entrances also serve as emergency exits whose proximity to all parts of buildings and facilities is essential, it is preferable that all entrances be accessible.

(c) If the only entrance to a building, or tenancy in a facility, is a service entrance, that entrance shall be accessible.

(d) Entrances which are not accessible shall have directional signage complying with Sections 11-4.30.1, 11-4.30.2, 11-4.30.3, and 11-4.30.5, which indicates the location of the nearest accessible entrance.

(9) In buildings or facilities, or portions of buildings or facilities, required to be accessible, accessible means of egress shall be provided in the same number as required for exits by local building/life safety regulations. Where a required exit from an occupiable level above or below a level of accessible exit discharge is not accessible, an area of rescue assistance shall be provided on each such level (in a number equal to that of inaccessible required exits). Areas of rescue assistance shall comply with Section 11-4.3.11. A horizontal exit, meeting the requirements of local building/life safety regulations, shall satisfy the requirement for an area of rescue assistance.

Exception: Areas of rescue assistance are not required in buildings or facilities having a supervised automatic sprinkler system.

(10) Drinking fountains.

(a) Where only one drinking fountain is provided on a floor, there shall be a drinking fountain which is accessible to individuals who use wheelchairs in accordance with Section 11-4.15 and one accessible to those who have difficulty bending or stooping. (This can be accommodated by the use of a “hi-lo” fountain; by providing one fountain accessible to those who use wheelchairs and one fountain at a standard height convenient for those who have difficulty bending; by providing a fountain accessible under Section 11-4.15 and a water cooler; or by such other means as would achieve the required accessibility for each group on each floor.)

(b) Where more than one drinking fountain or water cooler is provided on a floor, at least 50 percent of those provided shall comply with Section 11-4.15 and shall be on an accessible route.

(11) Toilet facilities. If toilet rooms are provided, then each public and common use toilet room shall comply with Section 11-4.22. Other toilet rooms provided for the use of occupants of specific spaces (i.e., a private toilet room for the occupant of a private office) shall be adaptable. If bathing rooms are provided, then each public and common use bathroom shall comply with Section 11-4.23. Accessible toilet rooms and bathing facilities shall be on an accessible route.

(12) Storage, shelving and display units.

(a) If fixed or built-in storage facilities such as cabinets, shelves, closets, and drawers are provided in accessible spaces, at least one of each type provided shall contain storage space complying with Section 11-4.25. Additional storage may be provided outside of the dimensions required by Section 11-4.25.

(b) Shelves or display units allowing self-service by customers in mercantile occupancies shall be located on an accessible route complying with Section 11-4.3. Requirements for accessible reach range do not apply.

(13) Controls and operating mechanisms in accessible spaces, along accessible routes, or as parts of accessible elements (for example, light switches and dispenser controls) shall comply with Section 11-4.27.

(14) If emergency warning systems are provided, then they shall include both audible alarms and visual alarms complying with Section 11-4.28. Sleeping accommodations required to comply with Section 11-9.3 shall have an alarm system complying with Section 11-4.28. Emergency warning systems in medical care facilities may be modified to suit standard health care alarm design practice.

(15) Detectable warnings shall be provided at locations as specified in Section 11-4.29.

(16) Building signage.

(a) Signs which designate permanent rooms and spaces shall comply with Sections 11-4.30.1, 11-4.30.4, 11-4.30.5 and 11-4.30.6.

(b) Other signs which provide direction to or information about functional spaces of the building shall comply with Sections 11-4.30.1, 11-4.30.2, 11-4.30.3, and 11-4.30.5.

Exception: Building directories, menus, and all other signs which are temporary are not required to comply.

(17) Public telephones.

(a) If public pay telephones, public closed circuit telephones, or other public telephones are provided, then they shall comply with Section 11-4.31.2 through Section 11-4.31.8 to the extent required by the following table:

Number of each type of telephone provided on each floor	Number of telephones required to comply with 11-4.31.2 through 11-4.31.8 ¹
1 or more single unit	1 per floor
1 bank ²	1 per floor
2 or more banks ²	1 per bank. Accessible unit may be installed as a single unit in proximity (either visible or with signage) to the bank. At least one public telephone per floor shall meet the requirements for a forward reach telephone. ³

¹ Additional public telephones may be installed at any height. Unless otherwise specified, accessible telephones may be either forward or side reach telephones.

² A bank consists of two or more adjacent public telephones, often installed as a unit.

³ **Exception:** For exterior installations only, if dial tone first service is available, then a side reach telephone may be installed instead of the required forward reach telephone (i.e., one telephone in proximity to each bank shall comply with Section 11-4.31).

(b) All telephones required to be accessible and complying with Section 11-4.31.2 through Section 11-4.31.8 shall be equipped with a volume control. In addition, 25 percent, but never less than one, of all other public telephones provided shall be equipped with a volume control and shall be dispersed among all types of public telephones, including closed circuit telephones, throughout the building or facility. Signage complying with applicable provisions of Section 11-4.30.7 shall be provided.

(c) The following shall be provided in accordance with Section 11-4.31.9:

(i) If a total number of four or more public pay telephones (including both interior and exterior phones)

is provided at a site, and at least one is in an interior location, then at least one interior public text telephone shall be provided.

- (ii) If an interior public pay telephone is provided in a stadium or arena, in a convention center, in a hotel with a convention center, or in a covered mall, at least one interior public text telephone shall be provided in the facility.
 - (iii) If a public pay telephone is located in or adjacent to a hospital emergency room, hospital recovery room, or hospital waiting room, one public text telephone shall be provided at each such location.
 - (d) Where a bank of telephones in the interior of a building consists of three or more public pay telephones, at least one public pay telephone in each such bank shall be equipped with a shelf and outlet in compliance with Section 11-4.31.9(2).
- (18) If fixed or built-in seating or tables (including, but not limited to, study carrels and student laboratory stations), are provided in accessible public or common use areas, at least 5 percent, but not less than one, of the fixed or built-in seating areas or tables shall comply with Section 11-4.32. An accessible route shall lead to and through such fixed or built-in seating areas, or tables.

(19) Assembly areas.

- (a) All public food service establishments, all establishments licensed under the beverage law for consumption on the premises, and places of assembly with fixed seating shall provide accessible seating or spaces for seating which comply with Sections 11-4.33.2, 11-4.33.3, and 11-4.33.4 and in accordance with the following requirements: For the first 100 seats, accessible and usable spaces shall be provided consistent with the following table:

Capacity of Seating in Assembly Areas	Number of Required Wheelchair Locations
1 to 25	1
26 to 50	2
51 to 100	4

For all remaining fixed seats, there shall be not less than one such accessible and usable space for each 100 fixed seats or fraction thereof.

In addition, 1 percent, but not less than one, of all fixed seats shall be aisle seats with no armrests on the aisle side, or removable or folding armrests on the aisle side. Each such seat shall be identified by a sign or marker. Signage notifying patrons of the availability of such seats shall be posted at the ticket office. Aisle seats are not required to comply with Section 11-4.33.4.

- (b) This paragraph applies to assembly areas where audible communications are integral to the use of the space (e.g., concert and lecture halls, playhouses and movie theaters, meeting rooms, etc.). Such assembly

areas, if (1) they accommodate at least 50 persons, or if they have audio-amplification systems, and (2) they have fixed seating, shall have a permanently installed assistive listening system complying with Section 11-4.33. For other assembly areas, a permanently installed assistive listening system, or an adequate number of electrical outlets or other supplementary wiring necessary to support a portable assistive listening system shall be provided. The minimum number of receivers to be provided shall be equal to 4 percent of the total number of seats, but in no case less than two. Signage complying with applicable provisions of Section 11-4.30 shall be installed to notify patrons of the availability of a listening system.

- (20) Where automated teller machines are provided, each machine shall comply with the requirements of Section 11-4.34 except where two or more are provided at a location, then only one must comply.

Exception: Drive-up-only automated teller machines are not required to comply with Sections 11-4.34.2 and 11-4.34.3.

- (21) Where dressing and fitting rooms are provided for use by the general public, patients, customers or employees, 5 percent, but never less than one, of dressing rooms for each type of use in each cluster of dressing rooms shall be accessible and shall comply with Section 11-4.35.

Examples of types of dressing rooms are those serving different genders or distinct and different functions as in different treatment or examination facilities.

11-4.1.4 Reserved.

11-4.1.5 Accessible buildings: Additions. Each addition to an existing building or facility shall be regarded as an alteration. Each space or element added to the existing building or facility shall comply with the applicable provisions of Section 11-4.1.1 to Section 11-4.1.3, minimum requirements for new construction, and the applicable technical specifications of Section 11-4.2 through Section 11-4.35 and Section 11-5 through Section 11-10. Each addition that affects or could affect the usability of an area containing a primary function shall comply with Section 11-4.1.6(2).

11-4.1.6 Accessible buildings: Alterations.

This edition of the code does not apply to buildings, structures or facilities which were in existence on October 1, 1997, unless:

- (i) The building, structure or facility is being converted from residential to nonresidential or mixed use, as defined by local law.
- (ii) The proposed alteration or renovation of the building, structure or facility will affect usability or accessibility to a degree which invokes the requirements of Section 303(a) of the ADA of 1990, or

(iii) The original construction or any former alteration or renovation of the building, structure or facility was carried out in violation of applicable permitting law:

(1) General. Alterations to existing buildings and facilities shall comply with the following:

- (a) No alteration shall be undertaken which decreases or has the effect of decreasing accessibility or usability of a building or facility below the requirements for new construction at the time of alteration.
- (b) If existing elements, spaces, or common areas are altered, then each such altered element, space, feature, or area shall comply with the applicable provisions of Section 11-4.1.1 to Section 11-4.1.3, minimum requirements for new construction. If the applicable provision for new construction requires that an element, space, or common area be on an accessible route, the altered element, space, or common area is not required to be on an accessible route except as provided in Section 11-4.1.6(2), alterations to an area containing a primary function.
- (c) If alterations of single elements, when considered together, amount to an alteration of a room or space in a building or facility, the entire space shall be made accessible.
- (d) No alteration of an existing element, space, or area of a building or facility shall impose a requirement for greater accessibility than that which would be required for new construction. For example, if the elevators and stairs in a building are being altered and the elevators are, in turn, being made accessible, then no accessibility modifications are required to the stairs connecting levels connected by the elevator. If stair modifications to correct unsafe conditions are required by other codes, the modifications shall be done in compliance with these guidelines unless technically infeasible.
- (e) At least one interior public text telephone complying with Section 11-4.31.9 shall be provided if:
 - (i) Alterations to existing buildings or facilities with less than four exterior or interior public pay telephones would increase the total number to four or more telephones with at least one in an interior location; or
 - (ii) Alterations to one or more exterior or interior public pay telephones occur in an existing building or facility with four or more public telephones with at least one in an interior location.
- (f) If an escalator or stair is planned or installed where none existed previously and major structural modifications are necessary for such installation, then a means of vertical access shall be provided that com-

plies with the applicable provisions of Section 11-4.7, 11-4.8, 11-4.10, or 11-4.11.

Nothing in this section shall be construed to relieve the owner of any building, structure or facility from the duty to provide vertical accessibility to all levels above and below occupiable grade level, regardless of whether the code requires an elevator to be installed in such building, structure, or facility, except for: (1) elevator pits, elevator penthouses, mechanical rooms, piping or equipment catwalks, and automobile lubrication and maintenance pits and platforms; (2) unoccupiable spaces, such as rooms, enclosed spaces, and storage spaces that are not designed for human occupancy, for public accommodations, or for work areas; and (3) occupiable spaces and rooms that are not open to the public and that house no more than five persons including, but not limited to, equipment control rooms and projection booths. However, as provided in Section 553.509, *Florida Statutes*, buildings, structures, and facilities must, at a minimum, comply with the requirements of the ADAAG. Therefore, facilities subject to the ADAAG may be required to provide vertical access to areas otherwise exempt under Section 11-4.1.3(5) of this code.

- (g) In alterations, the requirements of Sections 11-4.1.3(9), 11-4.3.10 and 11-4.3.11 do not apply.
- (h) Entrances: If a planned alteration entails alterations to an entrance, and the building has an accessible entrance, the entrance being altered is not required to comply with Section 11-4.1.3(8), except to the extent required by Section 11-4.1.6(2). If a particular entrance is not made accessible, appropriate accessible signage indicating the location of the nearest accessible entrance(s) shall be installed at or near the inaccessible entrance, such that a person with disabilities will not be required to retrace the approach route from the inaccessible entrance.
- (i) If the alteration work is limited solely to the electrical, mechanical, or plumbing system, or to hazardous material abatement, or automatic sprinkler retrofitting, and does not involve the alteration of any elements or spaces required to be accessible under these guidelines, then Section 11-4.1.6(2) does not apply.
- (j) **Exception:** In alteration work, if compliance with Section 11-4.1.6 is technically infeasible, the alteration shall provide accessibility to the maximum extent feasible. Any elements or features of the building or facility that are being altered and can be made accessible shall be made accessible within the scope of the alteration.

TECHNICALLY INFEASIBLE. With respect to an alteration of a building or a facility, it has little likelihood of being accomplished because existing structural conditions would require removing or altering a load-bearing member which is an essential part of the structural frame; or because other existing physical or site constraints prohibit modification or addition of elements, spaces, or features which are in full and strict compliance with the minimum requirements for new

construction and which are necessary to provide accessibility.

(k) Exception:

- (i) This code does not require the installation of an elevator in an altered facility that is less than three stories or has less than 3,000 square feet (279 m²) per story unless the building is a shopping center, a shopping mall, the professional office of a health care provider, or another type of facility as determined by the U. S. Attorney General.
- (ii) The exemption provided in Paragraph (i) does not obviate or limit in any way the obligation to comply with the other accessibility requirements established in this code. For example, alterations to floors above or below the ground floor must be accessible regardless of whether the altered facility has an elevator. If a facility subject to the elevator exemption set forth in Paragraph (i) nonetheless has a full passenger elevator, that elevator shall meet, to the maximum extent feasible, the accessibility requirements of this code.
- (iii) Nothing in this section shall be construed to relieve the owner of any building, structure or facility from the duty to provide vertical accessibility to all levels above and below occupiable grade level, regardless of whether the code requires an elevator to be installed in such building, structure, or facility, except for: (1) elevator pits, elevator penthouses, mechanical rooms, piping or equipment catwalks, and automobile lubrication and maintenance pits and platforms; (2) unoccupiable spaces, such as rooms, enclosed spaces, and storage spaces that are not designed for human occupancy, for public accommodations, or for work areas; and (3) occupiable spaces and rooms that are not open to the public and that house no more than five persons including, but not limited to, equipment control rooms and projection booths. However, as provided in Section 553.509, *Florida Statutes*, buildings, structures, and facilities must, at a minimum, comply with the requirements of the ADAAG. Therefore, facilities subject to the ADAAG may be required to provide vertical access to areas otherwise exempt under Section 11-4.1.3(5) of this code.
- (iv) A facility that is making alterations must comply with this section to the maximum extent feasible. If compliance with parking location requirements is not feasible, the facility may provide parking spaces at alternative locations for persons who have disabilities and provide appropriate signage directing persons who have a disability to alternative parking. The facility may not reduce the required number or dimensions of those spaces, nor may it unnecessarily increase the length of the accessible route from a parking space to the facility. The alteration must not create a significant risk to the health or safety of a person who has a disability or to that of others.

- (2) **Alterations to an area containing a primary function.** In addition to the requirements of Section 11-4.1.6(1), an alteration that affects or could affect the usability of or access to an area containing a primary function shall be made so as to ensure that, to the maximum extent feasible, the path of travel to the altered area and the restrooms, telephones, and drinking fountains serving the altered area, are readily accessible to and usable by individuals with disabilities, unless such alterations are disproportionate to the overall alterations in terms of cost and scope.

Alterations made to provide an accessible path of travel to altered areas shall be deemed disproportionate to the overall alteration when the cost exceeds 20 percent of the cost of the alteration to the primary function area.

Duty to provide accessible features in the event of disproportionality.

- (1) When the cost of alterations necessary to make the path of travel to the altered area fully accessible is disproportionate to the cost of the overall alteration, the path of travel shall be made accessible to the extent that it can be made accessible without incurring disproportionate costs.
- (2)(a) In choosing which accessible elements to provide, priority should be given to those elements that will provide the greatest access, in the following order:
 - (i) An accessible entrance;
 - (ii) An accessible route to the altered area;
 - (iii) At least one accessible restroom for each sex or a single unisex restroom;
 - (iv) Accessible telephones;
 - (v) Accessible drinking fountains; and
 - (vi) When possible, additional accessible elements such as parking, storage, and alarms.

(B) Series of smaller alterations.

- (i) The obligation to provide an accessible path of travel may not be evaded by performing a series of small alterations to the area served by a single path of travel if those alterations could have been performed as a single undertaking.
- (ii) If an area containing a primary function has been altered without providing an accessible path of travel to that area, and subsequent alterations of that area, or a different area on the same path of travel, are undertaken within three years of the original alteration, the total cost of alterations to the primary function areas on that path of travel during the preceding three-year period shall be considered in determining whether the cost of making that path of travel accessible is disproportionate.
- (iii) Only alterations undertaken after January 26, 1992, shall be considered in determining if the cost of providing an accessible path of travel is

disproportionate to the overall cost of the alterations.

(3) Special technical provisions for alterations to existing buildings and facilities:

(a) **Ramps.** Curb ramps and interior or exterior ramps to be constructed on sites or in existing buildings or facilities where space limitations prohibit the use of a 1:12 slope or less may have slopes and rises as follows:

- (i) A slope between 1:10 and 1:12 is allowed for a maximum rise of 6 inches (152 mm).
- (ii) A slope between 1:8 and 1:10 is allowed for a maximum rise of 3 inches (76 mm). A slope steeper than 1:8 is not allowed.

(b) **Stairs.** Full extension of handrails at stairs shall not be required in alterations where such extensions would be hazardous or impossible due to plan configuration.

(c) **Elevators.**

- (i) If safety door edges are provided in existing automatic elevators, automatic door reopening devices may be omitted (see Section 11-4.10.6).
- (ii) Where existing shaft configuration or technicality prohibits strict compliance with Section 11-4.10.9, the minimum car plan dimensions may be reduced by the minimum amount necessary, but in no case shall the inside car area be smaller than 48 inches by 48 inches (1219 mm by 1219 mm).
- (iii) Equivalent facilitation may be provided with an elevator car of different dimensions when usability can be demonstrated and when all other elements required to be accessible comply with the applicable provisions of Section 11-4.10. For example, an elevator of 47 inches by 69 inches (1195 mm by 1755 mm) with a door opening on the narrow dimension, could accommodate the standard wheelchair clearances shown in Figure 4.

(d) **Doors.**

- (i) Where it is technically infeasible to comply with clear opening width requirements of Section 11-4.13.5, a projection of $\frac{3}{8}$ inch (16 mm) maximum will be permitted for the latch side stop.
- (ii) If existing thresholds are $\frac{3}{4}$ inch (19 mm) high or less, and have (or are modified to have) a beveled edge on each side, they may remain.

(e) **Toilet rooms.**

- (i) Where it is technically infeasible to comply with Section 11-4.22 or 11-4.23, the installation of at least one unisex toilet/bathroom per floor, located in the same area as existing toilet facilities, will be permitted in lieu of modifying existing toilet facilities to be accessible. Each unisex toilet room shall contain one water closet comply-

ing with Section 11-4.16 and one lavatory complying with Section 11-4.19, and the door shall have a privacy latch.

(ii) Where it is technically infeasible to install a required standard stall [see Figure 30(a)], or where other codes prohibit reduction of the fixture count (i.e., removal of a water closet in order to create a double-wide stall), either alternate stall [see Figure 30(b)] may be provided in lieu of the standard stall.

(iii) When existing toilet or bathing facilities are being altered and are not made accessible, signage complying with Sections 11-4.30.1, 11-4.30.2, 11-4.30.3, 11-4.30.5 and 11-4.30.7 shall be provided indicating the location of the nearest accessible toilet or bathing facility within the facility.

(f) **Assembly areas.**

(i) Where it is technically infeasible to disperse accessible seating throughout an altered assembly area, accessible seating areas may be clustered. Each accessible seating area shall have provisions for companion seating and shall be located on an accessible route that also serves as a means of emergency egress.

(ii) Where it is technically infeasible to alter all performing areas to be on an accessible route, at least one of each type of performing area shall be made accessible.

(g) **Platform lifts (wheelchair lifts).** In alterations, platform lifts (wheelchair lifts) complying with Section 11-4.11 and applicable to this code shall be used as part of an accessible route. The use of lifts is not limited to the four conditions in Exception 4 of Section 11-4.1.3(5).

(h) **Dressing rooms.** In alterations where technical infeasibility can be demonstrated, one dressing room for each sex on each level shall be made accessible. Where only unisex dressing rooms are provided, accessible unisex dressing rooms may be used to fulfill this requirement.

11-4.1.7 Accessible buildings: Historic preservation.

(1) Applicability.

(a) **General rule.** Alterations to a qualified historic building or facility shall comply with Section 11-4.1.6, the applicable technical specifications of Section 11-4.2 through Section 11-4.35 and the applicable special application Section 11-5 through Section 11-10 unless it is determined in accordance with the procedures in Section 11-4.1.7(2) that compliance with the requirements for accessible routes (exterior and interior), ramps, entrances, or toilets would threaten or destroy the historic significance of the building or facility in which case the alternative requirements in Section 11-4.1.7(3) may be used for the feature.

Exceptions: Reserved.

(b) **Definition.** A qualified historic building or facility is a building or facility that is:

- (i) Listed in or eligible for listing in the National Register of Historic Places; or
- (ii) Designated as historic under an appropriate state or local law.

(2) Procedures.

(a) Alterations to qualified historic buildings and facilities subject to Section 106 of the National Historic Preservation Act.

(i) Section 106, Process. Section 106 of the National Historic Preservation Act (16 U.S.C. 470 f) requires that a federal agency with jurisdiction over a federal, federally assisted, or federally licensed undertaking consider the effects of the agency's undertaking on buildings and facilities listed in or eligible for listing in the National Register of Historic Places and give the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking prior to approval of the undertaking.

(ii) ADA application. Where alterations are undertaken to a qualified historic building or facility that is subject to Section 106 of the National Historic Preservation Act, the federal agency with jurisdiction over the undertaking shall follow the Section 106 process. If the state historic preservation officer or Advisory Council on Historic Preservation agrees that compliance with the requirements for accessible routes (exterior and interior), ramps, entrances, or toilets would threaten or destroy the historic significance of the building or facility, the alternative requirements in Section 11-4.1.7(3) may be used for the feature.

(b) Alterations to qualified historic buildings and facilities not subject to Section 106 of the National Historic Preservation Act. Where alterations are undertaken to a qualified historic building or facility that is not subject to Section 106 of the National Historic Preservation Act, if the entity undertaking the alterations believes that compliance with the requirements for accessible routes (exterior and interior), ramps, entrances, or toilets would threaten or destroy the historic significance of the building or facility and that the alternative requirements in Section 11-4.1.7(3) should be used for the feature, the entity should consult with the state historic preservation officer. If the state historic preservation officer agrees that compliance with the accessibility requirements for accessible routes (exterior and interior), ramps, entrances or toilets would threaten or destroy the historical significance of the building or facility, the alternative requirements in Section 11-4.1.7(3) may be used.

(c) Consultation with interested persons. Interested persons should be invited to participate in the consultation process, including state or local accessibility officials, individuals with disabilities, and organizations representing individuals with disabilities.

(d) Certified local government historic preservation programs. Where the state historic preservation officer has delegated the consultation responsibility for pur-

poses of this section to a local government historic preservation program that has been certified in accordance with Section 101(c) of the National Historic Preservation Act of 1966 [16 U.S.C. 470a (c)] and implementing regulations (36 CFR 61.5), the responsibility may be carried out by the appropriate local government body or official.

(3) Historic preservation: Minimum requirements.

(a) At least one accessible route complying with Section 11-4.3 from a site access point to an accessible entrance shall be provided.

Exception: A ramp with a slope no greater than 1:6 for a run not to exceed 2 feet (610 mm) may be used as part of an accessible route to an entrance.

(b) At least one accessible entrance complying with Section 11-4.14 which is used by the public shall be provided.

Exception: If it is determined that no entrance used by the public can comply with Section 11-4.14, then access at any entrance not used by the general public but open (unlocked) with directional signage at the primary entrance may be used. The accessible entrance shall also have a notification system. Where security is a problem, remote monitoring may be used.

(c) If toilets are provided, then at least one toilet facility complying with Sections 11-4.22 and 11-4.1.6 shall be provided along an accessible route that complies with Section 11-4.3. Such toilet facility may be unisex in design.

(d) Accessible routes from an accessible entrance to all publicly used spaces on at least the level of the accessible entrance shall be provided. Access shall be provided to all levels of a building or facility in compliance with Section 11-4.1 whenever practical.

(e) Displays and written information, documents, etc., should be located where they can be seen by a seated person. Exhibits and signage displayed horizontally (e.g., open books), should be no higher than 44 inches (1120 mm) above the floor surface.

11-4.1.8 Accessible buildings, structures and facilities: Architectural barrier removal.

(1) Removal of architectural barriers, pursuant to 28 C.F.R. Subpart C S. 36.304, from buildings, structures or facilities to which this code applies shall comply with Section 11-4.1 to Section 11-4.35 unless compliance would render the removal not readily achievable. In no instance shall the removal of an architectural barrier create a significant risk to the health or safety of an individual with disabilities or others.

(2) Barriers at common or emergency entrances and exits of business establishments conducting business with the general public that are existing, under construction, or under contract for construction which would prevent a person from using such entrances or exits shall be removed.

(3) The removal of architectural barriers from a parking facility in accordance with 28 C.F.R. Section 36.304 or with Section 553.508, *Florida Statutes*, must comply with this section unless compliance would cause the barrier removal not to be readily achievable. If compliance would cause the barrier removal not to be readily achievable, a facility may provide parking spaces at alternative locations for persons who have disabilities and provide appropriate signage directing persons who have disabilities to the alternative parking if readily achievable. The facility may not reduce the required number or dimensions of those spaces, nor may it unreasonably increase the length of the accessible route from a parking space to the facility. The removal of an architectural barrier must not create a significant risk to the health or safety of an individual with disabilities or others.

11-4.2 Space allowance and reach ranges.

11-4.2.1 Wheelchair passage width. The minimum clear width for single wheelchair passage shall be 32 inches (815 mm) at a point and 36 inches (915 mm) continuously [see Figure 1 and Figure 24(e)].

11-4.2.2 Width for wheelchair passing. The minimum width for two wheelchairs to pass is 60 inches (1525 mm) (see Figure 2).

11-4.2.3 Wheelchair turning space. The space required for a wheelchair to make a 180-degree turn is a clear space of 60 inches (1525 mm) diameter [see Figure 3(a)] or a T-shaped space [see Figure 3(b)].

11-4.2.4 Clear floor or ground space for wheelchairs.

11-4.2.4.1 Size and approach. The minimum clear floor or ground space required to accommodate a single, stationary wheelchair and occupant is 30 inches by 48 inches (760 mm by 1220 mm) [see Figure 4(a)]. The minimum clear floor or ground space for wheelchairs may be positioned for forward or parallel approach to an object [see Figure 4(b) and Figure 4(c)]. Clear floor or ground space for wheelchairs may be part of the knee space required under some objects.

11-4.2.4.2 Relationship of maneuvering clearance to wheelchair spaces. One full unobstructed side of the clear floor or ground space for a wheelchair shall adjoin or overlap an accessible route or adjoin another wheelchair clear floor space. If a clear floor space is located in an alcove or otherwise confined on all or part of three sides, additional maneuvering clearances shall be provided as shown in Figure 4(d) and Figure 4(e).

11-4.2.4.3 Surfaces for wheelchair spaces. Clear floor or ground spaces for wheelchairs shall comply with Section 11-4.5.

11-4.2.5 Forward reach. If the clear floor space only allows forward approach to an object, the maximum high forward reach allowed shall be 48 inches (1220 mm). The minimum low forward reach is 15 inches (380 mm) [see Figure 5(a)]. If the high forward reach is over an obstruction, reach and clearances shall be as shown in Figure 5(b).

11-4.2.6 Side reach. If the clear floor space allows parallel approach by a person in a wheelchair, the maximum high side reach allowed shall be 54 inches (1370 mm) and the low side reach shall be no less than 9 inches (230 mm) above the floor [see Figure 6(a) and Figure 6(b)]. If the side reach is over an obstruction, the reach and clearances shall be as shown in Figure 6(c).

11-4.3 Accessible route.

11-4.3.1 General. All walks, halls, corridors, aisles, skywalks, tunnels, and other spaces that are part of an accessible route shall comply with Section 11-4.3.

11-4.3.2 Location.

- (1) At least one accessible route within the boundary of the site shall be provided from public transportation stops, accessible parking, and accessible passenger loading zones, and public streets or sidewalks to the accessible building entrance they serve. The accessible route shall, to the maximum extent feasible, coincide with the route for the general public.
- (2) At least one accessible route shall connect accessible buildings, facilities, elements, and spaces that are on the same site.
- (3) At least one accessible route shall connect accessible building or facility entrances with all accessible spaces and elements and with all accessible dwelling units within the building or facility.
- (4) An accessible route shall connect at least one accessible entrance of each accessible dwelling unit with those exterior and interior spaces and facilities that serve the accessible dwelling unit.

11-4.3.3 Width. The minimum clear width of an accessible route shall be 36 inches (915 mm) except at doors (see Section 11-4.13.5 and 11-4.13.6). If a person in a wheelchair must make a turn around an obstruction, the minimum clear width of the accessible route shall be as shown in Figure 7(a) and Figure 7(b).

Exception: Curb ramps that are a part of a required means of egress shall be not less than 44 inches (1118 mm) wide.

11-4.3.4 Passing space. If an accessible route has less than 60 inches (1525 mm) clear width, then passing spaces at least 60 inches by 60 inches (1525 mm by 1525 mm) shall be located at reasonable intervals not to exceed 200 feet (61 m). A T-intersection of two corridors or walks is an acceptable passing place.

11-4.3.5 Headroom. Accessible routes shall comply with Section 11-4.4.2.

11-4.3.6 Surface textures. The surface of an accessible route shall comply with Section 11-4.5.

11-4.3.7 Slope. An accessible route with a running slope greater than 1:20 is a ramp and shall comply with Section 11-4.8. Nowhere shall the cross slope of an accessible route exceed 1:50.

11-4.3.8 Changes in level. Changes in levels along an accessible route shall comply with Section 11-4.5.2. If an

accessible route has changes in level greater than $\frac{1}{2}$ inch (13 mm), then a curb ramp, ramp, elevator, or platform lift (as permitted in Section 11-4.1.3 and 11-4.1.6) shall be provided that complies with Section 11-4.7, 11-4.8, 11-4.10, or 11-4.11, respectively. An accessible route does not include stairs, steps, or escalators. See definition of “Egress, means of” in Section 11-3.5 [see Figure 7(c) and Figure 7(d)].

11-4.3.9 Doors. Doors along an accessible route shall comply with Section 11-4.13.

11-4.3.10 Egress. Accessible routes serving any accessible space or element shall also serve as a means of egress for emergencies or connect to an accessible area of rescue assistance.

11-4.3.11 Areas of rescue assistance.

11-4.3.11.1 Location and construction. An area of rescue assistance shall be one of the following:

- (1) A portion of a stairway landing within a smokeproof enclosure (complying with local requirements).
- (2) A portion of an exterior exit balcony located immediately adjacent to an exit stairway when the balcony complies with local requirements for exterior exit balconies. Openings to the interior of the building located within 20 feet (6 m) of the area of rescue assistance shall be protected with fire assemblies having a $\frac{3}{4}$ hour fire protection rating.
- (3) A portion of a 1-hour fire-resistive corridor (complying with local requirements for fire-resistive construction and for openings) located immediately adjacent to an exit enclosure.
- (4) A vestibule located immediately adjacent to an exit enclosure and constructed to the same fire-resistive standards as required for corridors and openings.
- (5) A portion of a stairway landing within an exit enclosure which is vented to the exterior and is separated from the interior of the building with not less than 1-hour fire-resistive doors.
- (6) When approved by the appropriate local authority, an area or a room which is separated from other portions of the building by a smoke barrier. Smoke barriers shall have a fire-resistive rating of not less than one hour and shall completely enclose the area or room. Doors in the smoke barrier shall be tight-fitting smoke-and-draft control assemblies having a fire protection rating of not less than 20 minutes and shall be self-closing or automatic closing. The area or room shall be provided with an exit directly to an exit enclosure. Where the room or area exits into an exit enclosure which is required to be of more than 1-hour fire-resistive construction, the room or area shall have the same fire-resistive construction, including the same opening protection, as required for the adjacent exit enclosure.
- (7) An elevator lobby when elevator shafts and adjacent lobbies are pressurized as required for smokeproof enclosures by local regulations and when complying with requirements herein for size, communication,

and signage. Such pressurization system shall be activated by smoke detectors on each floor located in a manner approved by the appropriate local authority. Pressurization equipment and its duct work within the building shall be separated from other portions of the building by a minimum 2-hour fire-resistive construction.

11-4.3.11.2 Size. Each area of rescue assistance shall provide at least two accessible areas each being not less than 30 inches by 48 inches (760 mm by 1220 mm). The area of rescue assistance shall not encroach on any required exit width. The total number of such 30-inch by 48-inch (760 mm by 1220 mm) areas per story shall be not less than one for every 200 persons of calculated occupant load served by the area of rescue assistance.

Exception: The appropriate local authority may reduce the minimum number of 30-inch by 48-inch (760 mm by 1220 mm) areas to one for each area of rescue assistance on floors where the occupant load is less than 200.

11-4.3.11.3 Stairway width Each stairway adjacent to an area of rescue assistance shall have a minimum clear width of 48 (1220 mm) inches between handrails.

11-4.3.11.4 Two-way communication. A method of two-way communication, with both visible and audible signals, shall be provided between each area of rescue assistance and the primary entry. The fire department or appropriate local authority may approve a location other than the primary entry.

11-4.3.11.5 Identification. Each area of rescue assistance shall be identified by a sign, which states “AREA OF RESCUE ASSISTANCE” and displays the International Symbol of Accessibility. The sign shall be illuminated when exit sign illumination is required. Signage shall also be installed at all inaccessible exits and where otherwise necessary to clearly indicate the direction to areas of rescue assistance. In each area of rescue assistance, instructions on the use of the area under emergency conditions shall be posted adjoining the two-way communication system.

11-4.4 Protruding objects.

11-4.4.1 General. Objects projecting from walls (for example, telephones) with their leading edges between 27 inches and 80 inches (685 mm and 2030 mm) above the finished floor shall protrude no more than 4 inches (102 mm) into walks, halls, corridors, passageways, or aisles [see Figure 8(a)]. Objects mounted with their leading edges at or below 27 inches (685 mm) above the finished floor may protrude any amount [see Figure 8(a) and Figure 8(b)]. Free-standing objects mounted on posts or pylons may overhang 12 in (305 mm) maximum from 27 inches to 80 inches (685 mm to 2030 mm) above the ground or finished floor [see Figure 8(c) and Figure 8(d)]. Protruding objects shall not reduce the clear width of an accessible route or maneuvering space [see Figure 8(e)].

11-4.4.2 Headroom. Walks, halls, corridors, passageways, aisles, or other circulation spaces shall have 80 inches (2030 mm) minimum clear head room [see Figure 8(a)]. If vertical clearance of an area adjoining an accessible route is reduced

to less than 80 inches (2032 mm) (nominal dimension), a barrier to warn blind or visually-impaired persons shall be provided [see Figure 8(c-1)].

11-4.5 Ground and floor surfaces.

11-4.5.1 General. Ground and floor surfaces along accessible routes and in accessible rooms and spaces including floors, walks, ramps, stairs, and curb ramps, shall be stable, firm, slipresistant, and shall comply with Section 11-4.5.

11-4.5.2 Changes in level. Changes in level up to $\frac{1}{4}$ inches (6 mm) may be vertical and without edge treatment [see Figure 7(c)]. Changes in level between $\frac{1}{4}$ inch and $\frac{1}{2}$ inch (6 mm and 13 mm) shall be beveled with a slope no greater than 1:2 [see Figure 7(d)]. Changes in level greater than $\frac{1}{2}$ inch (13 mm) shall be accomplished by means of a ramp that complies with Section 11-4.7 or 11-4.8.

11-4.5.3 Carpet. If carpet or carpet tile is used on a ground or floor surface, then it shall be securely attached; have a firm cushion, pad, or backing, or no cushion or pad; and have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum pile thickness shall be $\frac{1}{2}$ inch (13 mm) [see Figure 8(f)]. Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim shall comply with Section 11-4.5.2.

11-4.5.4 Gratings. If gratings are located in walking surfaces, then they shall have spaces no greater than $\frac{1}{2}$ inch (13 mm) wide in one direction [see Figure 8(g)]. If gratings have elongated openings, then they shall be placed so that the long dimension is perpendicular to the dominant direction of travel [see Figure 8(h)].

11-4.6 Parking and passenger loading zones.

11-4.6.1 Minimum number. Parking spaces required to be accessible by Section 11-4.1 shall comply with Sections 11-4.6.2 through Section 11-4.6.5. Passenger loading zones required to be accessible by Section 11-4.1 shall comply with Section 11-4.6.5 and 11-4.6.6.

11-4.6.2 Location. Accessible parking spaces serving a particular building shall be located on the shortest safely accessible route of travel from adjacent parking to an accessible entrance. In parking facilities that do not serve a particular building, accessible parking shall be located on the shortest accessible route of travel to an accessible pedestrian entrance of the parking facility. In buildings with multiple accessible entrances with adjacent parking, accessible parking spaces shall be dispersed and located closest to the accessible entrances.

Each parking space must be no less than 12 feet (3658 mm) wide.

- (1) All spaces must be located on an accessible route no less than 44 inches (1118 mm) wide so that users will not be compelled to walk or wheel behind parked vehicles.
- (2) If a theme park or entertainment complex [as defined in Section 509.013(9), see definitions] provides parking in several lots or areas from which access to the theme park or entertainment complex is provided,

a single lot or area may be designated for parking by persons who have disabilities, if the lot or area is located on the shortest safely accessible route to an accessible entrance to the theme park or entertainment complex or to transportation to such accessible entrance.

- (3) On-street parallel parking spaces must be located either at the beginning or end of a block or adjacent to alley entrances.

11-4.6.3 Parking spaces. Parking access aisles must be no less than 5 feet (1524 mm) wide and must be part of an accessible route to the building or facility entrance. Two accessible spaces may share a common access aisle [see Figure 9(a)]. The access aisle shall be striped diagonally to designate it as a no-parking zone. Curb ramps must be located outside of the disabled parking spaces and access aisles.

Exception: If a theme park or entertainment complex in which are provided continuous attendant services for directing individuals to marked accessible parking spaces or designated lots for parking by persons who have disabilities, the park or complex may provide parking spaces that comply with the alternatives specified in Section 11-12.

Parked vehicle overhangs shall not reduce the clear width of an accessible route. Parking spaces and access aisles shall be level with surface slopes not exceeding 1:50 (2 percent) in all directions.

Parallel parking spaces must be even with surface slopes, may match the grade of the adjacent travel lane, and must not exceed a cross slope of 1:50, where feasible. Such spaces shall be designed per Sections 11-4.6.2 through 11-4.6.5.

Exception: Access aisles are not required.

Curbs adjacent to such spaces must be of a height that will not interfere with the opening and closing of motor vehicle doors.

11-4.6.4 Signage. Each accessible parking space must be prominently outlined with blue paint, and must be repainted as necessary, to be clearly distinguishable as a parking space designated for persons who have disabilities and must be posted with a permanent above-grade sign bearing the international symbol of accessibility, meeting the requirements of color and design approved by the Department of Transportation, of Section 11-4.30.7 and the caption "PARKING BY DISABLED PERMIT ONLY." Such sign erected after October 1, 1996, must indicate the penalty for illegal use of the space.

Van accessible parking spaces located within a parking structure shall have an additional sign reading "VAN ACCESSIBLE" mounted below the symbol of accessibility. Such signs shall be located so they cannot be obscured by a vehicle parked in the space.

A theme park or an entertainment complex as defined in Section 509.013(9), *Florida Statutes*, in which accessible parking is located in designated lots or areas, the signage indicating the lot as reserved for accessible parking may be lo-

cated at the entrances to the lot in lieu of a sign at each parking space.

Exception: Theme parks or entertainment complexes providing alternative parking spaces pursuant to the exception to Section 11-4.6.3 shall provide the “VAN ACCESSIBLE” sign complying with this section.

11-4.6.5 Vertical clearance. Provide minimum vertical clearance of 114 inches (2895 mm) at accessible passenger loading zones and along at least one vehicle access route to such areas from site entrance(s) and exit(s). At parking spaces complying with Section 11-4.1.2(5)(b), provide minimum vertical clearance of 98 inches (2490 mm) at the parking space and along at least one vehicle access route to such spaces from site entrance(s) and exit(s).

Every nonresidential structure built on or after January 1, 1991, which is designed to use covered or underground parking as the primary available parking space, shall design the covered or underground parking facility to maintain a minimum height for the portion of the street-accessible level of the parking facility directly over van accessible parking spaces and for providing ingress and egress to such parking spaces of at least 98 inches (2489 mm). Signs shall be posted to warn operators of permanent disability-equipped vans that they cannot pass beyond a certain point due to height limitations. If compliance with this minimum height clearance requirement will cause the structure to exceed local height limitations imposed by local zoning, planning, or fire ordinances, or will result in the imposition of any additional requirements of such ordinances, the structure may exceed the height limitation specified in those codes as necessary to comply with the requirements of this section and is exempt from such additional requirements. Structures for which the plans were sealed by an architect prior to January 1, 1991, are exempt from this section.

11-4.6.6 Passenger loading zones. Passenger loading zones shall provide an access aisle at least 60 inches (1525 mm) wide and 20 feet (6096 mm) long adjacent and parallel to the vehicle pull-up space (see Figure 10). If there are curbs between the access aisle and the vehicle pull-up space, then a curb ramp complying with Section 11-4.7 shall be provided. Vehicle standing spaces and access aisles shall be level with surface slopes not exceeding 1:50 (2 percent) in all directions.

11-4.7 Curb ramps.

11-4.7.1 Location. Curb ramps complying with Section 11-4.7 shall be provided wherever an accessible route crosses a curb.

Curb ramps must be located outside of disabled parking spaces and access aisles.

11-4.7.2 Slope. Slopes of curb ramps shall comply with Section 11-4.8.2. The slope shall be measured as shown in Figure 11. Transitions from ramps to walks, gutters, or streets shall be flush and free of abrupt changes. Maximum slopes of adjoining gutters, road surface immediately adjacent to the curb ramp, or accessible route shall not exceed 1:20.

11-4.7.3 Width. The minimum width of a curb ramp shall be 36 inches (915 mm), exclusive of flared sides.

Exception: Curb ramps that are a part of a required means of egress shall be not less than 44 inches (1118 mm) wide.

11-4.7.4 Surface. Surfaces of curb ramps shall comply with Section 11-4.5.

11-4.7.5 Sides of curb ramps. Curb ramps located where pedestrians must use them and all curb ramps which are not protected by handrails or guardrails shall have flared sides with a slope not exceeding a ratio of 1:12. Curb ramps with returned curbs may be used where pedestrians would not normally walk across the ramp [see Figure 12(b)].

11-4.7.6 Built-up curb ramps. Built-up curb ramps shall be located so that they do not project into vehicular traffic lanes (see Figure 13).

11-4.7.7 Detectable warnings. A curb ramp shall have a detectable warning complying with Section 11-4.29.2. The detectable warning shall extend the full width and depth of the curb ramp.

11-4.7.8 Obstructions. Curb ramps shall be located or protected to prevent their obstruction by parked vehicles.

11-4.7.9 Location at marked crossings. Curb ramps at marked crossings shall be wholly contained within the markings, excluding any flared sides (see Figure 15).

11-4.7.10 Diagonal curb ramps. If diagonal (or corner type) curb ramps have returned curbs or other well-defined edges, such edges shall be parallel to the direction of pedestrian flow. The bottom of diagonal curb ramps shall have 48 inch (1220 mm) minimum clear space as shown in Figure 15(c) and Figure 15(d). If diagonal curb ramps are provided at marked crossings, the 48 inch (1220 mm) clear space shall be within the markings [see Figure 15(c) and Figure 15(d)]. If diagonal curb ramps have flared sides, they shall also have at least a 24 inch (610 mm) long segment of straight curb located on each side of the curb ramp and within the marked crossing [see Figure 15(c)].

11-4.7.11 Islands. Any raised islands in crossings shall be cut through level with the street or have curb ramps at both sides and a level area at least 48 inches (1220 mm) long between the curb ramps in the part of the island intersected by the crossings [see Figure 15(a) and Figure 15(b)].

11-4.8 Ramps.

11-4.8.1 General. Any part of an accessible route with a slope greater than 1:20 shall be considered a ramp and shall comply with Section 11-4.8.

11-4.8.2 Slope and rise. The least possible slope shall be used for any ramp. The maximum slope of a ramp in new construction shall be 1 to 12. The maximum rise for any run shall be 30 inches (760 mm) (see Figure 16). Curb ramps and ramps to be constructed on existing sites or in existing buildings or facilities may have slopes and rises as shown as allowed in Section 11-4.1.6(3)(a) if space limitations prohibit the use of a 1 to 12 slope or less (see Section 11-4.1.6).

11-4.8.3 Clear Width. The minimum clear width of a ramp shall be 36 inches (915 mm).

Exception: Ramps that are part of a required means of egress shall be not less than 44 inches wide (1118 mm).

11-4.8.4 Landings. Ramps shall have level landings at bottom and top of each ramp and each ramp run. Landings shall have the following features:

- (1) The landing shall be at least as wide as the ramp run leading to it.
- (2) All landings on ramps shall be not less than 60 inches (1524 mm) clear, and the bottom of each ramp shall have not less than 72 inches (1829 mm) of straight and level clearance.
- (3) If ramps change direction at landings, the minimum landing size shall be 60 inches by 60 inches (1525 mm by 1525 mm).
- (4) If a doorway is located at a landing, then the area in front of the doorway shall comply with Section 11-4.13.6.

11-4.8.5 Handrails. If a ramp run has a rise greater than 6 inches (150 mm) or a horizontal projection greater than 72 inches (1830 mm), then it shall have handrails on both sides. Handrails are not required on curb ramps or adjacent to seating in assembly areas. Handrails shall comply with Section 11-4.26 and shall have the following features:

- (1) Handrails shall be provided along both sides of ramp segments. The inside handrail on switchback or dog-leg ramps shall always be continuous.
- (2) Handrails on ramps which are not continuous shall extend not less than 18 inches (457 mm) beyond the sloped segment at both the top and bottom, and shall be parallel to the floor or ground surface.
- (3) The clear space between the handrail and the wall shall be 1½ inches (38 mm).
- (4) Gripping surfaces shall be continuous.
- (5) Top of handrail gripping surfaces shall be mounted between 34 inches and 38 inches (865 mm and 965 mm) above ramp surfaces.
- (6) Ends of handrails shall be either rounded or returned smoothly to floor, wall, or post.
- (7) Handrails shall not rotate within their fittings.

11-4.8.6 Cross slope and surfaces. The cross slope of ramp surfaces shall be no greater than 1:50. Ramp surfaces shall comply with Section 11-4.5.

11-4.8.7 Edge protection. Ramps and landings with drop-offs shall have curbs, walls, railings, or projecting surfaces that prevent people from slipping off the ramp. Curbs shall be a minimum of 2 inches (50 mm) high (see Figure 17).

11-4.8.8 Outdoor conditions. Outdoor ramps and their approaches shall be designed so that water will not accumulate on walking surfaces.

11-4.9 Stairs.

11-4.9.1 Minimum number. Stairs required to be accessible by Section 11-4.1 shall comply with Section 11-4.9.

11-4.9.2 Treads and risers. On any given flight of stairs, all steps shall have uniform riser heights and uniform tread widths. Stair treads shall be no less than 11 inches (280 mm) wide, measured from riser to riser [see Figure 18(a)]. Open risers are not permitted.

11-4.9.3 Nosings. The undersides of nosing shall not be abrupt. The radius of curvature at the leading edge of the tread shall be no greater than ½ inch (13 mm). Risers shall be sloped or the underside of the nosing shall have an angle not less than 60 degrees from the horizontal. Nosing shall project no more than 1½ inches (38 mm) (see Figure 18).

11-4.9.4 Handrails. Stairways shall have handrails at both sides of all stairs. Handrails shall comply with Section 11-4.26 and shall have the following features:

- (1) Handrails shall be continuous along both sides of stairs. The inside handrail on switchback or dogleg stairs shall always be continuous [see Figure 19(a) and Figure 19(b)].
- (2) If handrails are not continuous, they shall extend at least 12 inches (305 mm) beyond the top riser and at least 12 inches (305 mm) plus the width of one tread beyond the bottom riser. At the top, the extension shall be parallel with the floor or ground surface. At the bottom, the handrail shall continue to slope for a distance of the width of one tread from the bottom riser; the remainder of the extension shall be horizontal [see Figure 19(c) and Figure 19(d)]. Handrail extensions shall comply with Section 11-4.4.
- (3) The clear space between handrails and wall shall be 1½ inches (38 mm).
- (4) Gripping surfaces shall be uninterrupted by newel posts, other construction elements, or obstructions.
- (5) Top of handrail gripping surface shall be mounted between 34 inches and 38 inches (865 mm and 965 mm) above stair nosing.
- (6) Ends of handrails shall be either rounded or returned smoothly to floor, wall or post.
- (7) Handrails shall not rotate within their fittings.

11-4.9.5 Detectable warnings at stairs. Reserved.

11-4.9.6 Outdoor conditions. Outdoor stairs and their approaches shall be designed so that water will not accumulate on walking surfaces.

11-4.10 Elevators.

11-4.10.1 General. Accessible elevators shall be on an accessible route and shall comply with Section 11-4.10 and with the ASME A17.1-1990, *Safety Code for Elevators and Escalators*. Freight elevators shall not be considered as meeting the requirements of this section unless the only elevators provided are used as combination passenger and freight elevators for the public and employees.

11-4.10.2 Automatic operation. Elevator operation shall be automatic. Each car shall be equipped with a self-leveling feature that will automatically bring the car to floor land-

ings within a tolerance of $\frac{1}{2}$ inch (12.7 mm) under rated loading to zero loading conditions. This self-leveling feature shall be automatic and independent of the operating device and shall correct the overtravel or undertravel.

11-4.10.3 Hall call buttons. Call buttons in elevator lobbies and halls shall be centered at 42 inches (1065 mm) above the floor. Such call buttons shall have visual signals to indicate when each call is registered and when each call is answered. Call buttons shall be a minimum of $\frac{3}{4}$ inch (19 mm) in the smallest dimension. The button designating the up direction shall be on top (see Figure 20). Buttons shall be raised or flush. Objects mounted beneath hall call buttons shall not project into the elevator lobby more than 4 inches (102 mm).

11-4.10.4 Hall lanterns. A visible and audible signal shall be provided at each hoistway entrance to indicate which car is answering a call. Audible signals shall sound once for the up direction and twice for the down direction or shall have verbal annunciators that say “up” or “down.” Visible signals shall have the following features:

- (1) Hall lantern fixtures shall be mounted so that their centerline is at least 72 inches (1830 mm) above the lobby floor (see Figure 20).
- (2) Visual elements shall be at least $2\frac{1}{2}$ inches (64 mm) in the smallest dimension.
- (3) Signals shall be visible from the vicinity of the hall call button (see Figure 20). In-car lanterns located in cars, visible from the vicinity of hall call buttons, and conforming to the above requirements, shall be acceptable.

11-4.10.5 Raised and Braille characters on hoistway entrances. All elevator hoist way entrances shall have raised and Braille floor designations provided on both jambs. The centerline of the characters shall be 60 inches (1525 mm) above finish floor. Such characters shall be 2 inches (50 mm) high and shall comply with Section 11-4.30.4. Permanently applied plates are acceptable if they are permanently fixed to the jambs (see Figure 20).

11-4.10.6 Door protective and reopening device. Elevator doors shall open and close automatically. They shall be provided with a reopening device that will stop and reopen a car door and hoist way door automatically if the door becomes obstructed by an object or person. The device shall be capable of completing these operations without requiring contact for an obstruction passing through the opening at heights of 5 inches and 29 inches (125 mm and 735 mm) above finish floor (see Figure 20). Door reopening devices shall remain effective for at least 20 seconds. After such an interval, doors may close in accordance with the requirements of ASME A17.1-1990.

11-4.10.7 Door and signal timing for hall calls. The minimum acceptable time from notification that a car is answering a call until the doors of that car start to close shall be calculated from the following equation:

$$T = D/(1.5 \text{ ft/s}) \text{ or } T = D/(445 \text{ mm/s})$$

where T = total time (in seconds) and D = distance (in feet or millimeters) from a point in the lobby or corridor 60 inches (1525 mm) directly in front of the farthest call button con-

trolling that car to the centerline of its hoistway door (see Figure 21). For cars with in-car lanterns, T begins when the lantern is visible from the vicinity of hall call buttons and an audible signal is sounded. The minimum acceptable notification time shall be 5 seconds.

11-4.10.8 Door delay for car calls. The minimum time for elevator doors to remain fully open in response to a car call shall be 3 seconds.

11-4.10.9 Floor plan of elevator cars. The floor area of elevator cars shall provide space for wheelchair users to enter the car, maneuver within reach of controls, and exit from the car. Acceptable door opening and inside dimensions shall be as shown in Figure 22. The clearance between the car platform sill and the edge of any hoist way landing shall be no greater than $1\frac{1}{4}$ inches (32 mm).

11-4.10.10 Floor surfaces. Floor surfaces shall comply with Section 11-4.5.

11-4.10.11 Illumination levels. The level of illumination at the car controls, platform, and car threshold and landing sill shall be at least 5 footcandles (53.8 lux).

11-4.10.12 Car controls. Elevator control panels shall have the following features:

(1) **Buttons.** All control buttons shall be at least $\frac{3}{4}$ inch (19 mm) in their smallest dimension. They shall be raised or flush.

(2) **Tactile, Braille, and visual control indicators.** All control buttons shall be designated by Braille and by raised standard alphabet characters for letters, Arabic characters for numerals, or standard symbols as shown in Figure 23(a), and as required in ASME A17.1-1990. Raised and Braille characters and symbols shall comply with Section 11-4.30. The call button for the main entry floor shall be designated by a raised star at the left of the floor designation [see Figure 23(a)]. All raised designations for control buttons shall be placed immediately to the left of the button to which they apply. Applied plates, permanently attached, are an acceptable means to provide raised control designations. Floor buttons shall be provided with visual indicators to show when each call is registered. The visual indicators shall be extinguished when each call is answered.

(3) **Height.** All floor buttons shall be no higher than 54 inches (1370 mm) above the finish floor for side approach and 48 inches (1220 mm) for front approach. Emergency controls, including the emergency alarm and emergency stop, shall be grouped at the bottom of the panel and shall have their centerlines no less than 35 inches (890 mm) above the finish floor [see Figure 23(a) and Figure 23(b)].

(4) **Location.** Controls shall be located on a front wall if cars have center opening doors, and at the side wall or at the front wall next to the door if cars have side opening doors [see Figure 23(c) and Figure 23(d)].

11-4.10.13 Car position indicators. In elevator cars, a visual car position indicator shall be provided above the car control panel or over the door to show the position of the elevator in the hoist way. As the car passes or stops at a floor

served by the elevators, the corresponding numerals shall illuminate, and an audible signal shall sound. Numerals shall be a minimum of 1/2 inch (12.7 mm) high. The audible signal shall be no less than 20 decibels with a frequency no higher than 1500 Hz. An automatic verbal announcement of the floor number at which a car stops or which a car passes may be substituted for the audible signal.

11-4.10.14 Emergency communications. If provided, emergency two-way communication systems between the elevator and a point outside the hoist way shall comply with ASME A17.1-1990. The highest operable part of a two-way communication system shall be a maximum of 48 inches (1219 mm) from the floor of the car. It shall be identified by a raised symbol and lettering complying with 11-4.30 and located adjacent to the device. If the system uses a handset then the length of the cord from the panel to the handset shall be at least 29 inches (735 mm). If the system is located in a closed compartment the compartment door hardware shall conform to Section 11-4.27, controls and operating mechanisms. The emergency intercommunication system shall not require voice communication.

11-4.11 Platform lifts (wheelchair lifts).

11-4.11.1 Location. Platform lifts (wheelchair lifts) permitted by Section 11-4.1 shall comply with the requirements of Section 11-4.11.

11-4.11.2 Other requirements. If platform lifts (wheelchair lifts) are used, they shall comply with Sections 11-4.2.4, 11-4.5, 11-4.27, and ASME A17.1, *Safety Code for Elevators and Escalators*, Section XX, 1990.

11-4.11.3 Entrance. If platform lifts are used then they shall facilitate unassisted entry, operation, and exit from the lift in compliance with Section 11-4.11.2.

11-4.12 Windows.

11-4.12.1 General. Reserved.

11-4.12.2 Window hardware. Reserved.

11-4.13 Doors.

11-4.13.1 General.

- (1) Doors required to be accessible by Section 11-4.1 shall comply with the requirements of Section 11-4.13.
- (2) All required doors and walk through openings in buildings excluding single family homes, duplexes, and triplexes not covered by the Americans with Disabilities Act of 1990 or the Fair Housing Act shall have at least 29 inches (737 mm) of clear width. [see Section 11-4.22.2(1), exception].

11-4.13.2 Revolving doors and turnstiles.

- (1) Revolving doors or turnstiles shall not be the only means of passage at an accessible entrance or along an accessible route. An accessible gate or door shall be provided adjacent to the turnstile or revolving door and shall be so designed as to facilitate the same use pattern.
- (2) Turnstiles shall not be used in occupancies which serve fewer than 100 persons, but turnstiles may be

used in occupancies which serve at least 100 persons if there is an unlocked alternate passageway on an accessible route affording not less than 32 inches (813 mm) of clearance, equipped with latching devices in accordance with this code.

11-4.13.3 Gates. Gates, including ticket gates, shall meet all applicable specifications of Section 11-4.13.

11-4.13.4 Double-leaf doorways. If doorways have two independently operated door leaves, then at least one leaf shall meet the specifications in Section 11-4.13.5 and Section 11-4.13.6. That leaf shall be an active leaf.

11-4.13.5 Clear width. Doorways shall have a minimum clear opening of 32 inches (813 mm) with the door open 90 degrees, measured between the face of the door and the opposite stop [see Figure 24(a), Figure 24(b), Figure 24(c), and Figure 24(d)]. Openings more than 24 inches (610 mm) in depth shall comply with Sections 11-4.2.1 and 11-4.3.3 [see Figure 24(e)].

Exception: Doors not requiring full user passage, such as shallow closets, may have the clear opening reduced to 20 inches (510 mm) minimum.

11-4.13.6 Maneuvering clearances at doors. Minimum maneuvering clearances at doors that are not automatic or power-assisted shall be as shown in Figure 25. The floor or ground area within the required clearances shall be level and clear.

Exception: Entry doors to acute care hospital bedrooms for in-patients shall be exempted from the requirement for space at the latch side of the door (see dimension "x" in Figure 25) if the door is at least 44 inches (1120 mm) wide.

11-4.13.7 Two doors in series. The minimum space between two hinged or pivoted doors in series shall be 48 inches (1219 mm) plus the width of any door swinging into the space. Doors in series shall swing either in the same direction or away from the space between the doors [see Figure 26(a)].

11-4.13.8 Thresholds at doorways. Thresholds at doorways shall not exceed 3/4 inch (19 mm) in height for exterior sliding doors or 1/2 inch (12.7 mm) for other types of doors. Raised thresholds and floor level changes at accessible doorways shall be beveled with a slope no greater than 1:2 (see Section 11-4.5.2).

11-4.13.9 Door hardware. Handles, pulls, latches, locks, and other operating devices on accessible doors shall have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate. Lever-operated mechanisms, push-type mechanisms, and U-shaped handles are acceptable designs. When sliding doors are fully open, operating hardware shall be exposed and usable from both sides. Hardware required for accessible door passage shall be mounted no higher than 48 inches (1219 mm) above finish floor.

11-4.13.10 Door closers. If a door has a closer, then the sweep period of the closer shall be adjusted so that from an open position of 70 degrees, the door will take at least 3 sec-

onds to move to a point 3 inches (76 mm) from the latch, measured to the leading edge of the door.

11-4.13.11 Door opening force. The maximum force for pushing or pulling open a door shall be as follows:

- (1) Fire doors shall have the minimum opening force allowable by the appropriate administrative authority.
- (2) **Other doors.**
 - (a) Exterior hinged doors shall be so designed that such doors can be pushed or pulled open with a force not exceeding 8.5 lbf (37.8 N).
 - (b) Interior hinged doors: 5 lbf (22.2 N)
 - (c) Sliding or folding doors: 5 lbf (22.2 N)

These forces do not apply to the force required to retract latch bolts or disengage other devices that may hold the door in a closed position.

11-4.13.12 Automatic doors and power-assisted doors. If an automatic door is used, then it shall comply with ANSI/BHMA A156.10-1985. Slowly opening, low-powered, automatic doors shall comply with ANSI A156.19-1984. Such doors shall not open to back check faster than 3 seconds and shall require no more than 15 lbf (66.6 N) to stop door movement. If a power-assisted door is used, its door-opening force shall comply with Section 11-4.13.11 and its closing shall conform to the requirements in ANSI A156.19-1984.

11-4.14 Entrances.

11-4.14.1 Minimum number. Entrances required to be accessible by Section 11-4.1 shall be part of an accessible route complying with Section 11-4.3. Such entrances shall be connected by an accessible route to public transportation stops, to accessible parking and passenger loading zones, and to public streets or sidewalks if available [see Section 11-4.3.2(1)]. They shall also be connected by an accessible route to all accessible spaces or elements within the building or facility.

11-4.14.2 Service entrances. A service entrance shall not be the sole accessible entrance unless it is the only entrance to a building or facility (for example, in a factory or garage).

11-4.15 Drinking fountains and water coolers.

11-4.15.1 Minimum number. Drinking fountains or water coolers required to be accessible by Section 11-4.1 shall comply with Section 11-4.15.

11-4.15.2 Spout height. Spouts shall be no higher than 36 inches (915 mm), measured from the floor or ground surfaces to the spout outlet [see Figure 27(a)].

11-4.15.3 Spout location. The spouts of drinking fountains and water coolers shall be at the front of the unit and shall direct the water flow in a trajectory that is parallel or nearly parallel to the front of the unit. The spout shall provide a flow of water at least 4 inches (102 mm) high so as to allow the insertion of a cup or glass under the flow of water. On an accessible drinking fountain with a round or oval bowl, the spout must be positioned so the flow of water is within 3 inches (76 mm) of the front edge of the fountain.

11-4.15.4 Controls. Controls shall comply with Section 11-4.27.4. Unit controls shall be front mounted or side mounted near the front edge.

11-4.15.5 Clearances.

- (1) Wall- and post-mounted cantilevered units shall have a clear knee space between the bottom of the apron and the floor or ground at least 27 inches (685 mm) high, 30 inches (760 mm) wide, and 17 inches to 19 inches (430 mm to 485 mm) deep [see Figure 27(a) and Figure 27(b)]. Such units shall also have a minimum clear floor space 30 inches by 48 inches (760 mm by 1219 mm) to allow a person in a wheelchair to approach the unit facing forward.
- (2) Free-standing or built-in units not having a clear space under them shall have a clear floor space at least 30 inches by 48 inches (760 mm by 1219 mm) that allows a person in a wheelchair to make a parallel approach to the unit [see Figure 27(c) and Figure 27(d)]. This clear floor space shall comply with Section 11-4.2.4.

11-4.16 Water closets.

11-4.16.1 General. Accessible water closets shall comply with Section 11-4.16.

11-4.16.2 Clear floor space. Clear floor space for water closets not in stalls shall comply with Figure 28. Clear floor space may be arranged to allow either a left-handed or right-handed approach.

11-4.16.3 Height. The height of water closets shall be 17 inches to 19 inches (430 mm to 485 mm) measured to the top of the toilet seat [see Figure 29(b)]. Seats shall not be sprung to return to a lifted position.

11-4.16.4 Grab bars. Grab bars for water closets not located in stalls shall comply with Section 11-4.26 and Figure 29. The grab bar behind the water closet shall be 36 inches (915 mm) minimum.

11-4.16.5 Flush controls. Flush controls shall be hand operated or automatic and shall comply with Section 11-4.27.4. Controls for flush valves shall be mounted on the wide side of toilet areas no more than 44 inches (1120 mm) above the floor.

11-4.16.6 Dispensers. Toilet paper dispensers shall be installed within reach, as shown in Figure 29(b). Dispensers that control delivery, or that do not permit continuous paper flow, shall not be used.

11-4.17 Toilet stalls.

11-4.17.1 Location. Accessible toilet stalls shall be on an accessible route and shall meet the requirements of Section 11-4.17.

11-4.17.2 Water closets. Water closets in accessible stalls shall comply with Section 11-4.16.

11-4.17.3 Size and arrangement. The size and arrangement of the standard toilet stall shall comply with Figure 30(a), Standard Stall. Standard toilet stalls with a minimum depth of 56 inches (1420 mm) [see Figure 30(a)] shall have wall-mounted water closets. If the depth of a standard toilet

stall is increased at least 3 inches (76 mm), then a floor-mounted water closet may be used. Arrangements shown for standard toilet stalls may be reversed to allow either a left-or right-hand approach. Additional stalls shall be provided in conformance with Section 11-4.22.4

Exception: In instances of alteration work where provision of a standard stall [see Figure 30(a)] is technically infeasible or where plumbing code requirements prevent combining existing stalls to provide space, either alternate stall [see Figure 30(b)] may be provided in lieu of the standard stall.

Exception: New construction.

(1) The standard accessible restroom stall shall contain an accessible lavatory within it, the size of such lavatory to be not less than 19 inches wide by 17 inches (483 mm by 432 mm) deep, nominal size, and wall mounted. The lavatory shall be mounted so as not to overlap the clear floor space areas required by Section 11-4.17 [see Figure 30(a) and Figure 30(e)] and to comply with Section 11-4.19 of the code. Such lavatories shall be counted as part of the required fixture count for the building.

(2) The accessible water closet shall be located in the corner, diagonal to the door.

11-4.17.4 Toe clearances. In standard stalls, the front partition and at least one side partition shall provide a toe clearance of at least 9 inches (230 mm) above the floor. If the depth of the stall is greater than 60 inches (1525 mm), then the toe clearance is not required.

11-4.17.5 Doors. Toilet stall doors, including door hardware, shall comply with Section 11-4.13. The doors shall be self closing. If toilet stall approach is from latch side of the stall door, clearance between the door side of the stall and any obstruction may be reduced to a minimum of 42 inches (1065 mm) (see Figure 30). Doors shall not swing into the clear floor space of any fixture.

11-4.17.6 Grab bars. Grab bars complying with the length and positioning shown in Figures 30(a), 30(b), 30(c), and 30(d) shall be provided. Grab bars may be mounted with any desired method as long as they have a gripping surface at the locations shown and do not obstruct the required clear floor area. Grab bars shall comply with Section 11-4.26.

11-4.18 Urinals.

11-4.18.1 General. Accessible urinals shall comply with Section 11-4.18.

11-4.18.2 Height. Urinals shall be stall-type or wall-hung with an elongated rim at a maximum of 17 inches (430 mm) above the finish floor.

11-4.18.3 Clear floor space. A clear floor space 30 inches by 48 inches (760 mm by 1220 mm) shall be provided in front of urinals to allow forward approach. This clear space shall adjoin or overlap an accessible route and shall comply with Section 11-4.2.4. Urinal shields that do not extend be-

yond the front edge of the urinal rim may be provided with 29 inches (735 mm) clearance between them.

11-4.18.4 Flush controls. Flush controls shall be hand operated or automatic, and shall comply with Section 11-4.27.4, and shall be mounted no more than 44 inches (1120 mm) above the finish floor.

11-4.19 Lavatories and mirrors.

11-4.19.1 General. The requirements of Section 11-4.19 shall apply to lavatory fixtures, vanities, and built-in lavatories.

11-4.19.2 Height and clearances. Lavatories shall be mounted with the rim or counter surface no higher than 34 inches (865 mm) above the finish floor. Provide a clearance of at least 29 inches (735 mm) above the finish floor to the bottom of the apron. Knee and toe clearance shall comply with Figure 31.

11-4.19.3 Clear floor space. A clear floor space 30 inches by 48 inches (760 mm by 1219 mm) complying with Section 11-4.2.4 shall be provided in front of a lavatory to allow forward approach. Such clear floor space shall adjoin or overlap an accessible route and shall extend a maximum of 19 inches (485 mm) underneath the lavatory (see Figure 32).

11-4.19.4 Exposed pipes and surfaces. Hot water and drain pipes under lavatories shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories.

11-4.19.5 Faucets. Faucets shall comply with Section 11-4.27.4. Lever-operated, push-type, and electronically controlled mechanisms are examples of acceptable designs. If self-closing valves are used the faucet shall remain open for at least 10 seconds.

11-4.19.6 Mirrors. Mirrors shall be mounted with the bottom edge of the reflecting surface no higher than 40 inches (1015 mm) above the finish floor (see Figure 31).

11-4.20 Bathtubs.

11-4.20.1 General. Accessible bathtubs shall comply with Section 11-4.20.

11-4.20.2 Floor space. Clear floor space in front of bathtubs shall be as shown in Figure 33.

11-4.20.3 Seat. An in-tub seat or a seat at the head end of the tub shall be provided as shown in Figure 33 and Figure 34. The structural strength of seats and their attachments shall comply with Section 11-4.26.3. Seats shall be mounted securely and shall not slip during use.

11-4.20.4 Grab bars. Grab bars complying with Section 11-4.26 shall be provided as shown in Figure 33 and Figure 34.

11-4.20.5 Controls. Faucets and other controls complying with Section 11-4.27.4 shall be located as shown in Figure 34.

11-4.20.6 Shower unit. A shower spray unit with a hose at least 60 inches (1525 mm) long that can be used both as a

fixed shower head and as a hand-held shower shall be provided.

11-4.20.7 Bathtub enclosures. If provided, enclosures for bathtubs shall not obstruct controls or transfer from wheelchairs onto bathtub seats or into tubs. Enclosures on bathtubs shall not have tracks mounted on their rims.

11-4.21 Shower stalls.

11-4.21.1 General. Accessible shower stalls shall comply with Section 11-4.21.

11-4.21.2 Size and clearances. Except as specified in Section 11-9.1.2, shower stall size and clear floor space shall comply with Figure 35(a) or Figure 35(b). The shower stall in Figure 35(a) shall be 36 inches by 36 inches (915 mm by 915 mm). Shower stalls required by Section 11-9.1.2 shall comply with Figure 57(a) or Figure 57(b). The shower stall in Figure 35(b) will fit into the space required for a bathtub.

11-4.21.3 Seat. A seat shall be provided in shower stalls 36 inches by 36 inches (915 mm by 915 mm) and shall be as shown in Figure 36. The seat shall be mounted 17 inches to 19 inches (430 mm to 485 mm) from the bathroom floor and shall extend the full depth of the stall. In a 36-inch by 36-inch (915 mm by 915 mm) shower stall, the seat shall be on the wall opposite the controls. Where a fixed seat is provided in a 30-inch by 60-inch minimum (760 mm by 1525 mm) shower stall, it shall be a folding type and shall be mounted on the wall adjacent to the controls as shown in Figure 57. The structural strength of seats and their attachments shall comply with Section 11-4.26.3.

11-4.21.4 Grab bars. Grab bars complying with Section 11-4.26 shall be provided as shown in Figure 37.

11-4.21.5 Controls. Faucets and other controls complying with Section 11-4.27.4 shall be located as shown in Figure 37. In shower stalls 36 inches by 36 inches (915 mm by 915 mm), all controls, faucets, and the shower unit shall be mounted on the side wall opposite the seat.

11-4.21.6 Shower unit. A shower spray unit with a hose at least 60 inches (1525 mm) long that can be used both as a fixed shower head and as a hand-held shower shall be provided.

Exception: In unmonitored facilities where vandalism is a consideration, a fixed shower head mounted at 48 inches (1220 mm) above the shower floor may be used in lieu of a hand-held shower head.

11-4.21.7 Curbs. If provided, curbs in shower stalls 36 inches by 36 inches (915 mm by 915 mm) shall be no higher than 1/2 inch (13 mm). Shower stalls that are 30 inches by 60 inches (760 mm by 1525 mm) minimum shall not have curbs.

11-4.21.8 Shower enclosures. If provided, enclosures for shower stalls shall not obstruct controls or obstruct transfer from wheelchairs onto shower seats.

11-4.22 Toilet rooms.

11-4.22.1 Minimum number. Toilet facilities required to be accessible by Section 11-4.1 shall comply with Section 11-4.22. Accessible toilet rooms shall be on an accessible route.

11-4.22.2 Doors.

- (1) All doors to accessible toilet rooms shall comply with Section 11-4.13. Doors shall not swing into the clear floor space required for any fixture.

Exception: All new single-family houses, duplexes, triplexes, condominiums, and townhouses shall provide at least one bathroom, located with maximum possible privacy, where bathrooms are provided on habitable grade levels, with a door that has a 29-inch (737 mm) clear opening. However, if only a toilet room is provided at grade level, such toilet room shall have a clear opening of not less than 29 inches (737 mm).

11-4.22.3 Clear floor space. The accessible fixtures and controls required in Sections 11-4.22.4, 11-4.22.5, 11-4.22.6 and 11-4.22.7 shall be on an accessible route. An unobstructed turning space complying with Section 11-4.2.3 shall be provided within an accessible toilet room. The clear floor space at fixtures and controls, the accessible route, and the turning space may overlap.

11-4.22.4 Water closets. If toilet stalls are provided, then at least one shall be a standard toilet stall complying with Section 11-4.17; where six or more stalls are provided, in addition to the stall complying with Section 11-4.17.3, at least one stall 36 inches (915 mm) wide with an outward swinging, self-closing door and parallel grab bars complying with Figure 30(d) and Section 11-4.26 shall be provided. Water closets in such stalls shall comply with Section 11-4.16. If water closets are not in stalls, then at least one shall comply with Section 11-4.16.

11-4.22.5 Urinals. If urinals are provided, then at least one shall comply with Section 11-4.18.

11-4.22.6 Lavatories and mirrors. If lavatories and mirrors are provided, then at least one of each shall comply with Section 11-4.19.

11-4.22.7 Controls and dispensers. If controls, dispensers, receptacles, or other equipment are provided, then at least one of each shall be on an accessible route and shall comply with Section 11-4.27.

11-4.23 Bathrooms, bathing facilities and shower rooms.

11-4.23.1 Minimum number. Bathrooms, bathing facilities, or shower rooms required to be accessible by Section 11-4.1 shall comply with Section 11-4.23 and shall be on an accessible route.

11-4.23.2 Doors. Doors to accessible bathrooms shall comply with Section 11-4.13. Doors shall not swing into the floor space required for any fixture.

Exception: All new single-family houses, duplexes, triplexes, condominiums, and townhouses shall provide at least one bathroom, located with maximum possible pri-

vacy, where bathrooms are provided on habitable grade levels, with a door that has a 29-inch (737 mm) clear opening. However, if only a toilet room is provided at grade level, such toilet room shall have a clear opening of not less than 29 inches (737 mm).

11-4.23.3 Clear floor space. The accessible fixtures and controls required in Sections 11-4.23.4, 11-4.23.5, 11-4.23.6, 11-4.23.7, 11-4.23.8 and 11-4.23.9 shall be on an accessible route. An unobstructed turning space complying with Section 11-4.2.3 shall be provided within an accessible bathroom. The clear floor spaces at fixtures and controls, the accessible route, and the turning space may overlap.

11-4.23.4 Water closets. If toilet stalls are provided, then at least one shall be a standard toilet stall complying with Section 11-4.17; where six or more stalls are provided, in addition to the stall complying with Section 11-4.17.3, at least one stall 36 inches (915 mm) wide with an outward swinging, self-closing door and parallel grab bars complying with Figure 30(d) and Section 11-4.26 shall be provided. Water closets in such stalls shall comply with Section 11-4.16. If water closets are not in stalls, then at least one shall comply with Section 11-4.16.

11-4.23.5 Urinals. If urinals are provided, then at least one shall comply with Section 11-4.18.

11-4.23.6 Lavatories and mirrors. If lavatories and mirrors are provided, then at least one of each shall comply with Section 11-4.19.

11-4.23.7 Controls and dispensers. If controls, dispensers, receptacles, or other equipment are provided, then at least one of each shall be on an accessible route and shall comply with Section 11-4.27.

11-4.23.8 Bathing and shower facilities. If tubs or showers are provided, then at least one accessible tub that complies with Section 11-4.20 or at least one accessible shower that complies with Section 11-4.21 shall be provided.

11-4.23.9 Medicine cabinets. If medicine cabinets are provided, at least one shall be located with a usable shelf no higher than 44 inches (1120 mm) above the floor space. The floor space shall comply with Section 11-4.2.4.

11-4.24 Sinks.

11-4.24.1 General. Sinks required to be accessible by Section 11-4.1 shall comply with Section 11-4.24.

11-4.24.2 Height. Sinks shall be mounted with the counter or rim no higher than 34 inches (865 mm) above the finish floor.

11-4.24.3 Knee clearance. Knee clearance that is at least 27 inches (685 mm) high, 30 inches (760 mm) wide, and 19 inches (485 mm) deep shall be provided underneath sinks.

11-4.24.4 Depth. Each sink shall be a maximum of 6 $\frac{1}{2}$ inches (165 mm) deep.

11-4.24.5 Clear floor space. A clear floor space at least 30 inches by 48 inches (760 mm by 1219 mm) complying with Section 11-4.2.4 shall be provided in front of a sink to allow

forward approach. The clear floor space shall be on an accessible route and shall extend a maximum of 19 inches (485 mm) underneath the sink (see Figure 32).

11-4.24.6 Exposed pipes and surfaces. Hot water and drain pipes exposed under sinks shall be insulated or otherwise configured so as to protect against contact. There shall be no sharp or abrasive surfaces under sinks.

11-4.24.7 Faucets. Faucets shall comply with Section 11-4.27.4. Lever-operated, push-type, touch-type, or electronically controlled mechanisms are acceptable designs.

11-4.25 Storage.

11-4.25.1 General. Fixed storage facilities such as cabinets, shelves, closets, and drawers required to be accessible by Section 11-4.1 shall comply with Section 11-4.25.

11-4.25.2 Clear floor space. A clear floor space at least 30 inches by 48 inches (760 mm by 1219 mm) complying with Section 11-4.2.4 that allows either a forward or parallel approach by a person using a wheelchair shall be provided at accessible storage facilities.

11-4.25.3 Height. Accessible storage spaces shall be within at least one of the reach ranges specified in Section 11-4.2.5 and 11-4.2.6 (see Figure 5 and Figure 6). Clothes rods or shelves shall be a maximum of 54 inches (1370 mm) above the finish floor for a side approach. Where the distance from the wheelchair to the clothes rod or shelf exceeds 10 inches (255 mm) (as in closets without accessible doors) the height and depth to the rod or shelf shall comply with Figure 38(a) and Figure 38(b).

11-4.25.4 Hardware. Hardware for accessible storage facilities shall comply with Section 11-4.27.4. Touch latches and U-shaped pulls are acceptable.

11-4.26 Handrails, grab bars, and tub and shower seats.

11-4.26.1 General. All handrails, grab bars, and tub and shower seats required to be accessible by Section 11-4.1, 11-4.8, 11-4.9, 11-4.16, 11-4.17, 11-4.20 or 11-4.21 shall comply with Section 11-4.26.

11-4.26.2 Size and spacing of grab bars and handrails. The diameter or width of the gripping surfaces of a handrail or grab bar shall be 1 $\frac{1}{4}$ inches to 1 $\frac{1}{2}$ inches (32 mm to 38 mm), or the shape shall provide an equivalent gripping surface. If handrails or grab bars are mounted adjacent to a wall, the space between the wall and the grab bar shall be 1 $\frac{1}{2}$ inches (38 mm) [see Figure 39(a), Figure 39(b), Figure 39(c), and Figure 39(e)]. Handrails may be located in a recess if the recess is a maximum of 3 inches (76 mm) deep and extends at least 18 inches (455 mm) above the top of the rail [see Figure 39(d)].

11-4.26.3 Structural strength. The structural strength of grab bars, tub and shower seats, fasteners and mounting devices shall meet the following specification:

- (1) Bending stress in a grab bar or seat induced by the maximum bending moment from the application of

250 lbf (1112 N) shall be less than the allowable stress for the material of the grab bar or seat.

- (2) Shear stress induced in a grab bar or seat by the application of 250 lbf (1112 N) shall be less than the allowable shear stress for the material of the grab bar or seat. If the connection between the grab bar or seat and its mounting bracket or other support is considered to be fully restrained, then direct and torsional shear stresses shall be totaled for the combined shear stress, which shall not exceed the allowable shear stress.
- (3) Shear force induced in a fastener or mounting device from the application of 250 lbf (1112 N) shall be less than the allowable lateral load of either the fastener or mounting device or the supporting structure, whichever is the smaller allowable load.
- (4) Tensile force induced in a fastener by a direct tension force of 250 lbf (1112 N) plus the maximum moment from the application of 250 lbf (1112 N) shall be less than the allowable withdrawal load between the fastener and the supporting structure.

- (5) Grab bars shall not rotate within their fittings.

11-4.26.4 Eliminating hazards. A handrail or grab bar and any wall or other surface adjacent to it shall be free of any sharp or abrasive elements. Edges shall have a minimum radius of $\frac{1}{8}$ inches (3.2 mm).

11-4.27 Controls and operating mechanisms.

11-4.27.1 General. Controls and operating mechanisms required to be accessible by Section 11-4.1 shall comply with Section 11-4.27.

11-4.27.2 Clear floor space. Clear floor space complying with Section 11-4.2.4 that allows a forward or a parallel approach by a person using a wheelchair shall be provided at controls, dispensers, receptacles and other operable equipment.

11-4.27.3 Height. The highest operable part of controls, dispensers, receptacles, and other operable equipment shall be placed within at least one of the reach ranges specified in Sections 11-4.2.5 and 11-4.2.6. Electrical and communications system receptacles on walls shall be mounted no less than 15 inches (380 mm) above the floor.

Exception: These requirements do not apply where the use of special equipment dictates otherwise or where electrical and communications systems receptacles are not normally intended for use by building occupants.

11-4.27.4 Operation. Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N).

11-4.28 Alarms.

11-4.28.1 General. Alarm systems required to be accessible by Section 11-4.1 shall comply with Section 11-4.28. At a minimum, visual signal appliances shall be provided in

buildings and facilities in each of the following areas: restrooms and any other general usage areas (e.g., meeting rooms), hallways, lobbies, and any other area for common use.

11-4.28.2 Audible alarms. If provided, audible emergency alarms shall produce a sound that exceeds the prevailing equivalent sound level in the room or space by at least 15 dbA or exceeds any maximum sound level with a duration of 60 seconds by 5 dbA, whichever is louder. Sound levels for alarm signals shall not exceed 120 dbA.

11-4.28.3 Visual alarms. Visual alarm signal appliances shall be integrated into the building or facility alarm system. If single station audible alarms are provided then single station visual alarm signals shall be provided. Visual alarm signals shall have the following minimum photometric and location features:

- (1) The lamp shall be a xenon strobe type or equivalent.
- (2) The color shall be clear or nominal white (i.e., unfiltered or clear filtered white light).
- (3) The maximum pulse duration shall be two-tenths of one second (0.2 sec) with a maximum duty cycle of 40 percent. The pulse duration is defined as the time interval between initial and final points of 10 percent of maximum signal.
- (4) The intensity shall be a minimum of 75 candela.
- (5) The flash rate shall be a minimum of 1 Hz and a maximum of 3 Hz.
- (6) The appliance shall be placed 80 inches (2030 mm) above the highest floor level within the space or 6 inches (152 mm) below the ceiling, whichever is lower.
- (7) In general, no place in any room or space required to have a visual signal appliance shall be more than 50 feet (15 m) from the signal (in the horizontal plane). In large rooms and spaces exceeding 100 feet (30 m) across, without obstructions 6 feet (2 m) above the finish floor, such as auditoriums, devices may be placed around the perimeter, spaced a maximum 100 feet (30 m) apart, in lieu of suspending appliances from the ceiling.
- (8) No place in common corridors or hallways in which visual alarm signaling appliances are required shall be more than 50 feet (15 m) from the signal.

11-4.28.4 Auxiliary alarms. Units and sleeping accommodations shall have a visual alarm connected to the building emergency alarm system or shall have a standard 110-volt electrical receptacle into which such an alarm can be connected and a means by which a signal from the building emergency alarm system can trigger such an auxiliary alarm. When visual alarms are in place the signal shall be visible in all areas of the unit or room. Instructions for use of the auxiliary alarm or receptacle shall be provided.

11-4.29 Detectable warnings.

11-4.29.1 General. Detectable warnings required by Sections 11-4.1 and 11-4.7 shall comply with 11-4.29.

11-4.29.2 Detectable warnings on walking surfaces.

- (1) All detectable warning surfaces required by the code shall be governed by the requirements of ANSI A117.1-1986.
- (2) Detectable warning textures on walking surfaces shall consist of exposed aggregate concrete, cushioned surfaces made of rubber or plastic, raised strips, or grooves. Textures shall contrast with that of the surrounding surface. Raised strips or grooves shall comply with Figure 40(a) and Figure 40(b). Grooves may be used indoors only.

11-4.29.3 Detectable warnings on doors to hazardous areas. Reserved.

11-4.29.4 Detectable warnings at stairs. Reserved.

11-4.29.5 Detectable warnings at hazardous vehicular areas. If a walk crosses or adjoins a vehicular way, and the walking surfaces are not separated by curbs, railings, or other elements between the pedestrian areas and vehicular areas, the boundary between the areas shall be defined by a continuous detectable warning which is 36 inches (915 mm) wide, complying with Section 11-4.29.2.

11-4.29.6 Detectable warnings at reflecting pools. The edges of reflecting pools shall be protected by railings, walls, curbs, or detectable warnings complying with Section 11-4.29.2.

11-4.29.7 Standardization. Reserved.

11-4.30 Signage.

11-4.30.1 General. Signage required to be accessible by Section 11-4.1 shall comply with the applicable provisions of Section 11-4.30.

11-4.30.2 Character proportion. Letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10.

11-4.30.3 Character height. Characters and numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case "X." Lower case characters are permitted.

<u>Height Above Finished Floor</u>	<u>Minimum Character Height</u>
Suspended or Projected Overhead in compliance with Section 11-4.4.2	3 inches (75 mm) minimum

11-4.30.4 Raised and Brailled characters and pictorial symbol signs (pictograms). Letters and numerals shall be raised $\frac{1}{32}$ inches (.8 mm), upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille. Raised characters shall be at least $\frac{5}{8}$ inches (16 mm) high, but no higher than 2 inches (51 mm). Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. The border dimension of the pictogram shall be 6 inches (152 mm) minimum in height.

11-4.30.5 Finish and contrast. The characters and background of signs shall be eggshell, matte, or other nonglare finish. Characters and symbols shall contrast with their background—either light characters on a dark background or dark characters on a light background.

11-4.30.6 Mounting location and height. Where permanent identification is provided for rooms and spaces, signs shall be installed on the wall adjacent to the latch side of the door. Where there is no wall space to the latch side of the door, including at double leaf doors, signs shall be placed on the nearest adjacent wall. Mounting height shall be 60 inches (1525 mm) above the finish floor to the centerline of the sign. Mounting location for such signage shall be so that a person may approach within 3 inches (76 mm) of signage without encountering protruding objects or standing within the swing of a door.

11-4.30.7 Symbols of accessibility.

(1) Facilities and elements required to be identified as accessible by Section 11-4.1 shall use the international symbol of accessibility. The symbol shall be displayed as shown in Figure 43(a) and Figure 43(b).

(2) **Volume control telephones.** Telephones required to have a volume control by Section 11-4.1.3(17)(b) shall be identified by a sign containing a depiction of a telephone handset with radiating sound waves.

(3) **Text telephones.** Text telephones required by Section 11-4.1.3(17)(c) shall be identified by the international TDD symbol [see Figure 43(c)]. In addition, if a facility has a public text telephone, directional signage indicating the location of the nearest text telephone shall be placed adjacent to all banks of telephones which do not contain a text telephone. Such directional signage shall include the international TDD symbol. If a facility has no banks of telephones, the directional signage shall be provided at the entrance (e.g., in a building directory).

(4) **Assistive listening systems.** In assembly areas where permanently installed assistive listening systems are required by Section 11-4.1.3(19)(b) the availability of such systems shall be identified with signage that includes the international symbol of access for hearing loss [Figure 43(d)].

11-4.30.8 Illumination levels. Reserved.

11-4.31 Telephones.

11-4.31.1 General. Public telephones required to be accessible by Section 11-4.1 shall comply with Section 11-4.31.

11-4.31.2 Clear floor or ground space. A clear floor or ground space at least 30 inches by 48 inches (760 mm by 1220 mm) that allows either a forward or parallel approach by a person using a wheelchair shall be provided at telephones (see Figure 44). The clear floor or ground space shall comply with Section 11-4.2.4. Bases, enclosures, and fixed seats shall not impede approaches to telephones by people who use wheelchairs.

11-4.31.3 Mounting height. The highest operable part of the telephone shall be within the reach ranges specified in Section 11-4.2.5 or Section 11-4.2.6.

11-4.31.4 Protruding objects. Telephones shall comply with Section 11-4.4.

11-4.31.5 Hearing aid compatible and volume control telephones required by Section 11-4.1.

- (1) Telephones shall be hearing aid compatible.
- (2) Volume controls, capable of a minimum of 12 dbA and a maximum of 18 dbA above normal, shall be provided in accordance with Section 11-4.1.3. If an automatic reset is provided then 18 dbA may be exceeded.

11-4.31.6 Controls. Telephones shall have pushbutton controls where service for such equipment is available.

11-4.31.7 Telephone books. Telephone books, if provided, shall be located in a position that complies with the reach ranges specified in Sections 11-4.2.5 and 11-4.2.6.

11-4.31.8 Cord length. The cord from the telephone to the handset shall be at least 29 inches (735 mm) long.

11-4.31.9 Text telephones required by Section 11-4.1.

- (1) Text telephones used with a pay telephone shall be permanently affixed within, or adjacent to, the telephone enclosure. If an acoustic coupler is used, the telephone cord shall be sufficiently long to allow connection of the text telephone and the telephone receiver.
- (2) Pay telephones designed to accommodate a portable text telephone shall be equipped with a shelf and an electrical outlet within or adjacent to the telephone enclosure. The telephone handset shall be capable of being placed flush on the surface of the shelf. The shelf shall be capable of accommodating a text telephone and shall have 6 inches (152 mm) minimum vertical clearance in the area where the text telephone is to be placed.
- (3) Equivalent facilitation may be provided. For example, a portable text telephone may be made available in a hotel at the registration desk if it is available on a 24-hour basis for use with nearby public pay telephones. In this instance, at least one pay telephone shall comply with Paragraph (2) of this section. In addition, if an acoustic coupler is used, the telephone handset cord shall be sufficiently long so as to allow connection of the text telephone and the telephone receiver. Directional signage shall be provided and shall comply with Section 11-4.30.7.

11-4.32 Fixed or built-in seating and tables.

11-4.32.1 Minimum number. Fixed or built-in seating or tables required to be accessible by Section 11-4.1 shall comply with Section 11-4.32.

11-4.32.2 Seating. If seating spaces for people in wheelchairs are provided at fixed tables or counters, clear floor space complying with Section 11-4.2.4 shall be provided. Such clear floor space shall not overlap knee space by more than 19 inches (485 mm) (see Figure 45).

All fixed seating in public food service establishments, in establishments licensed under the Beverage Law for con-

sumption on the premises, and in all other facilities governed by reference Section 11-4.1 shall be designed and constructed in accordance with the following requirements:

- (1) All aisles adjacent to fixed seating shall provide clear floor space for wheelchairs.
- (2) Where there are open positions along both sides of such aisles, the aisles shall be not less than 52 inches (1321 mm) wide.

11-4.32.3 Knee clearances. If seating for people in wheelchairs is provided at tables or counters, knee spaces at least 27 inches (685 mm) high, 30 inches (760 mm) wide, and 19 inches (485 mm) deep shall be provided (see Figure 45).

11-4.32.4 Height of tables or counters. The tops of accessible tables and counters shall be from 28 inches to 34 inches (710 mm to 865 mm) above the finish floor or ground.

11-4.33 Assembly areas.

11-4.33.1 Minimum number. All public food service establishments, all establishments licensed under the beverage law for consumption on the premises, and assembly and associated areas required to be accessible by Section 11-4.1 shall comply with Section 11-4.33.

11-4.33.2 Size of wheelchair locations. Each wheelchair location shall provide minimum clear ground or floor spaces as shown in Figure 46.

11-4.33.3 Placement of wheelchair locations. Wheelchair areas shall be an integral part of any fixed seating plan and shall be provided so as to provide people with physical disabilities a choice of admission prices and lines of sight comparable to those for members of the general public. They shall adjoin an accessible route that also serves as a means of egress in case of emergency. At least one companion fixed seat shall be provided next to each wheelchair seating area. When the seating capacity exceeds 300, wheelchair spaces shall be provided in more than one location. Readily removable seats may be installed in wheelchair spaces when the spaces are not required to accommodate wheelchair users.

Exception: Accessible viewing positions may be clustered for bleachers, balconies, and other areas having sight lines that require slopes of greater than 5 percent. Equivalent accessible viewing positions may be located on levels having accessible egress.

11-4.33.4 Surfaces. The ground or floor at wheelchair locations shall be level and shall comply with Section 11-4.5.

11-4.33.5 Access to performing areas. An accessible route shall connect wheelchair seating locations with performing areas, including stages, arena floors, dressing rooms, locker rooms, and other spaces used by performers.

11-4.33.6 Placement of listening systems. If the listening system provided serves individual fixed seats, then such seats shall be located within a 50 feet (15 m) viewing distance of the stage or playing area and shall have a complete view of the stage or playing area.

11-4.33.7 Types of listening systems. Assistive listening systems (ALS) are intended to augment standard public address and audio systems by providing signals which can be

received directly by persons with special receivers or their own hearing aids and which eliminate or filter background noise. The type of assistive listening system appropriate for a particular application depends on the characteristics of the setting, the nature of the program, and the intended audience. Magnetic induction loops, infrared and radio frequency systems are types of listening systems which are appropriate for various applications.

11-4.34 Automated teller machines.

11-4.34.1 General. Each automated teller machine required to be accessible by Section 11-4.1.3 shall be on an accessible route and shall comply with Section 11-4.34.

11-4.34.2 Clear floor space. The automated teller machine shall be located so that clear floor space complying with Section 11-4.2.4 is provided to allow a person using a wheelchair to make a forward approach, a parallel approach, or both, to the machine.

11-4.34.3 Reach ranges.

(1) Forward approach only. If only a forward approach is possible, operable parts of all controls shall be placed within the forward reach range specified in Section 11-4.2.5.

(2) Parallel approach only. If only a parallel approach is possible, operable parts of controls shall be placed as follows:

(a) Reach depth not more than 10 inches (255 mm). Where the reach depth to the operable parts of all controls as measured from the vertical plane perpendicular to the edge of the unobstructed clear floor space at the farthest protrusion of the automated teller machine or surround is not more than 10 inches (255 mm), the maximum height above the finish floor or grade shall be 54 inches (1370 mm).

(b) Reach depth more than 10 inches (255 mm). Where the reach depth to the operable parts of any control as measured from the vertical plane perpendicular to the edge of the unobstructed clear floor space at the farthest protrusion of the automated teller machine or surround is more than 10 inches (255 mm), the maximum height above the finish floor or grade shall be as follows:

Reach Depth		Maximum Height	
In	mm	In	mm
10	255	54	1370
11	280	53 ^{1/2}	1360
12	305	53	1345
13	330	52 ^{1/2}	1335
14	355	51 ^{1/2}	1310
15	380	51	1295
16	405	50 ^{1/2}	1285
17	430	50	1270
18	455	49 ^{1/2}	1255
19	485	49	1245
20	510	48 ^{1/2}	1230
21	535	47 ^{1/2}	1205
22	560	47	1195
23	585	46 ^{1/2}	1180
24	610	46	1170

(3) Forward and parallel approach. If both a forward and parallel approach are possible, operable parts of controls shall be placed within at least one of the reach ranges in paragraphs Section 11-4.34.3(1) or Section 11-4.34.3(2) of this section.

(4) Bins. Where bins are provided, for envelopes, waste paper, or other purposes, at least one of each type provided shall comply with the applicable reach ranges in paragraph Section 11-4.34.3(1), 11-4.34.3(2) or 11-4.34.3(3) of this section.

Exception: Where a function can be performed in a substantially equivalent manner by using an alternate control, only one of the controls needed to perform that function is required to comply with this section. If the controls are identified by tactile markings, such markings shall be provided on both controls.

11-4.34.4 Controls. Controls for user activation shall comply with Section 11-4.27.4.

11-4.34.5 Equipment for persons with vision impairments. Instructions and all information for use shall be made accessible to and independently usable by persons with vision impairments.

11-4.35 Dressing and fitting rooms.

11-4.35.1 General. Dressing and fitting rooms required to be accessible by Section 11-4.1 shall comply with Section 11-4.35 and shall be on an accessible route.

11-4.35.2 Clear floor space. A clear floor space allowing a person using a wheelchair to make a 180-degree turn shall be provided in every accessible dressing room entered through a swinging or sliding door. No door shall swing into any part of the turning space. Turning space shall not be required in a private dressing room entered through a curtained opening at least 32 inches (815 mm) wide if clear floor space complying with Section 11-4.2 renders the dressing room usable by a person using a wheelchair.

11-4.35.3 Doors. All doors to accessible dressing rooms shall be in compliance with Section 11-4.13.

11-4.35.4 Bench. Every accessible dressing room shall have a 24 inches by 48 inches (610 mm by 1219 mm) bench fixed to the wall along the longer dimension. The bench shall be mounted 17 inches to 19 inches (430 mm to 485 mm) above the finish floor. Clear floor space shall be provided alongside the bench to allow a person using a wheelchair to make a parallel transfer onto the bench. The structural strength of the bench and attachments shall comply with Section 11-4.26.3. Where installed in conjunction with showers, swimming pools, or other wet locations, water shall not accumulate upon the surface of the bench and the bench shall have a slip-resistant surface.

11-4.35.5 Mirror. Where mirrors are provided in dressing rooms of the same use, then in an accessible dressing room, a full-length mirror, measuring at least 18 inches wide by 54 inches high (460 mm by 1370 mm), shall be mounted in a position affording a view to a person on the bench as well as to a person in a standing position.

SECTION 11-5 RESTAURANTS AND CAFETERIAS

11-5.1 General. Except as specified or modified in this section, restaurants and cafeterias shall comply with the requirements of Section 11-4.1 to Section 11-4.35. Where fixed tables (or dining counters where food is consumed but there is no service) are provided, at least 5 percent, but not less than one, of the fixed tables (or a portion of the dining counter) shall be accessible and shall comply with Section 11-4.32 as required in Section 11-4.1.3(18). In establishments where separate areas are designated for smoking and nonsmoking patrons, the required number of accessible fixed tables (or counters) shall be proportionally distributed between the smoking and nonsmoking areas. In new construction, and where practicable in alterations, accessible fixed tables (or counters) shall be distributed throughout the space or facility.

11-5.2 Counters and bars. Where food or drink is served at counters exceeding 34 inches (865 mm) in height for consumption by customers seated on stools or standing at the counter, a portion of the main counter which is 60 inches (1525 mm) in length minimum shall be provided in compliance with Section 11-4.32 or service shall be available at accessible tables within the same area.

11-5.3 Access aisles. All accessible fixed tables shall be accessible by means of an access aisle at least 36 inches (915 mm) clear between parallel edges of tables or between a wall and the table edges.

11-5.4 Dining areas. In new construction, all dining areas, including raised or sunken dining areas, loggias, and outdoor seating areas, shall be accessible. In alterations, accessibility to raised or sunken dining areas, or to all parts of outdoor seating areas is not required provided that the same services and decor are provided in an accessible space usable by the general public and are not restricted to use by people with disabilities.

Exception: Nothing in this section shall be construed to relieve the owner of the duty to provide vertical accessibility to all levels above and below occupiable grade level, regardless of whether the code requires an elevator to be installed in such buildings, structures or facilities except: (1) elevator pits, elevator penthouses, mechanical rooms, piping or equipment catwalks, and automobile lubrication and maintenance pits and platforms; (2) unoccupiable spaces, such as rooms, enclosed spaces, and storage spaces that are not designed for human occupancy, for public accommodations, or for work areas; and (3) occupiable spaces and rooms that are not open to the public and that house no more than five persons including, but not limited to, equipment control rooms and projection booths. Therefore, facilities subject to the ADA may be required to provide vertical access to areas otherwise exempt under Section 11-4.1.3(5), of the code.

11-5.5 Food service lines. Food service lines shall have a minimum clear width of 36 inches (915 mm), with a preferred clear width of 42 inches (1065 mm) to allow passage around a person using a wheelchair. Tray slides shall be mounted no higher than 34 inches (865 mm) above the floor (see Figure 53). If self-service shelves are provided, at least 50 percent of each type must be within reach ranges specified in Sections 11-4.2.5 and 11-4.2.6.

11-5.6 Tableware and condiment areas. Self-service shelves and dispensing devices for tableware, dishware, condiments, food and beverages shall be installed to comply with Section 11-4.2 (see Figure 54).

11-5.7 Raised platforms. In banquet rooms or spaces where a head table or speaker's lectern is located on a raised platform, the platform shall be accessible in compliance with Section 11-4.8 or Section 11-4.11. Open edges of a raised platform shall be protected by placement of tables or by a curb.

11-5.8 Vending machines and other equipment. Spaces for vending machines and other equipment shall comply with Section 11-4.2 and shall be located on an accessible route.

11-5.9 Quiet areas. Reserved.

SECTION 11-6 MEDICAL CARE FACILITIES

11-6.1 General. Medical care facilities included in this section are those in which people receive physical or medical treatment or care and where persons may need assistance in responding to an emergency and where the period of stay may exceed 24 hours. In addition to the requirements of Sections 11-4.1 through 11-4.35, medical care facilities and buildings shall comply with Section 11-6.

(1) Hospitals—general purpose hospitals, psychiatric facilities, detoxification facilities. At least 10 percent of patient bedrooms and toilets and all public use and common use areas are required to be designed and constructed to be accessible.

(2) Hospitals and rehabilitation facilities that specialize in treating conditions that affect mobility, or units within either that specialize in treating conditions that affect mobility. All patient bedrooms and toilets, and all public use and common use areas are required to be designed and constructed to be accessible.

(3) Long-term care facilities and nursing homes. At least 50 percent of patient bedrooms and toilets, and all public use and common use areas are required to be designed and constructed to be accessible.

(4) Alterations to patient bedrooms.

(a) When patient bedrooms are being added or altered as part of a planned renovation of an entire wing, a department, or other discrete area of an existing medical facility, a percentage of the patient bedrooms that are being added or altered shall comply with Section 11-6.3. The percentage of accessible rooms provided shall be consistent with the percentage of rooms required to be accessible by the applicable requirements of Sections 11-6.1(1), 11-6.1(2), or 11-6.1(3), until the number of accessible patient bedrooms in the facility equals the overall number that would be required if the facility were newly constructed. (For example, if 20 patient bedrooms are being altered in the obstetrics department of a hospital, two of the altered rooms must be made accessible. If, within the same hospital, 20 patient bedrooms are being altered in a unit that specializes in treating mobility impairments, all of the altered rooms must be made accessible.) Where toilet/bathrooms are part of patient bedrooms which are added or altered and required to be accessible, each such patient toilet/bathroom shall comply with Section 11-6.4.

(b) When patient bedrooms are being added or altered individually, and not as part of an alteration of the entire area, the altered patient bedrooms shall comply with Section 11-6.3, unless either: (a) the number of accessible rooms provided in the department or area containing the altered patient bedroom equals the number of accessible patient bedrooms that would be required if the percentage requirements of Section 11-6.1(1), 11-6.1(2), or 11-6.1(3) were applied to that department or area; or (b) the number of accessible patient bedrooms in the facility equals the overall number that would be required if the facility were newly constructed. Where toilet/bathrooms are part of patient bedrooms which are added or altered and required to be accessible, each such toilet/bathroom shall comply with Section 11-6.4.

11-6.2 Entrances. At least one accessible entrance that complies with Section 11-4.14 shall be protected from the weather by canopy or roof overhang. Such entrances shall incorporate a passenger loading zone that complies with Section 11-4.6.6.

11-6.3 Patient bedrooms. Provide accessible patient bedrooms in compliance with Section 11-4.1 through Section

11-4.35. Accessible patient bedrooms shall comply with the following:

(1) Each bedroom shall have a door that complies with Section 11-4.13.

Exceptions: Entry doors to acute care hospital bedrooms for in-patients shall be exempted from the requirement in Section 11-4.13.6 for maneuvering space at the latch side of the door if the door is at least 44 inches (1120 mm) wide.

(2) Each bedroom shall have adequate space to provide a maneuvering space that complies with Section 11-4.2.3. In rooms with two beds, it is preferable that this space be located between beds.

(3) Each bedroom shall have adequate space to provide a minimum clear floor space of 36 inches (915 mm) along each side of the bed and to provide an accessible route complying with Section 11-4.3.3 to each side of each bed.

11-6.4 Patient toilet rooms. Where toilet/bath rooms are provided as a part of a patient bedroom, each patient bedroom that is required to be accessible shall have an accessible toilet/bath room that complies with Section 11-4.22 or 11-4.23 and shall be on an accessible route.

SECTION 11-7 BUSINESS AND MERCANTILE

11-7.1 General. In addition to the requirements of Sections 11-4.1 to 11-4.35, the design of all areas used for business transactions with the public shall comply with Section 11-7.

11-7.2 Sales and service counters, teller windows, information counters.

(1) In department stores and miscellaneous retail stores where counters have cash registers and are provided for sales or distribution of goods or services to the public, at least one of each type shall have a portion of the counter which is at least 36 inches (915 mm) in length with a maximum height of 36 inches (915 mm) above the finish floor. It shall be on an accessible route complying with Section 11-4.3. The accessible counters must be dispersed throughout the building or facility. In alterations where it is technically infeasible to provide an accessible counter, an auxiliary counter meeting these requirements may be provided.

(2) At ticketing counters, teller stations in a bank, registration counters in hotels and motels, box office ticket counters, and other counters that may not have a cash register but at which goods or services are sold or distributed, either:

(i) A portion of the main counter which is a minimum of 36 inches (915 mm) in length shall be provided with a maximum height of 36 inches (915 mm); or

- (ii) An auxiliary counter with a maximum height of 36 in (915 mm) in close proximity to the main counter shall be provided; or
- (iii) Equivalent facilitation shall be provided (e.g., at a hotel registration counter, equivalent facilitation might consist of:
 - (1) Provision of a folding shelf attached to the main counter on which an individual with disabilities can write, and
 - (2) Use of the space on the side of the counter or at the concierge desk, for handing materials back and forth).

All accessible sales and service counters shall be on an accessible route complying with Section 11-4.3.

- (3) **Assistive listening devices.** Reserved.

11-7.3 Check-out aisles.

- (1) In new construction, accessible check-out aisles shall be provided in conformance with the table below:

Total Check-out Aisles of Each Design	Minimum Number of Accessible Check-out Aisles of Each Design
1 - 4	1
5 - 8	2
8 - 15	3
Over 15	3, plus 20% of additional aisles

Exception:

1. In new construction, where the selling space is under 5,000 square feet (465 m²), only one check-out aisle is required to be accessible.
2. In alterations, at least one check-out aisle shall be accessible in facilities under 5,000 square feet (465 m²) of selling space. In facilities of 5,000 or more square feet (465 m²) of selling space, at least one of each design of check-out aisle shall be made accessible when altered until the number of accessible check-out aisles of each design equals the number required in new construction.

Examples of check-out aisles of different “design” include those which are specifically designed to serve different functions. Different “design” includes but is not limited to the following features length of belt or no belt; or permanent signage designating the aisle as an express lane.

- (2) Clear aisle width for accessible check-out aisles shall comply with Section 11-4.2.1 and maximum adjoining counter height shall not exceed 38 inches (965 mm) above the finish floor. The top of the lip shall not exceed 40 inches (1015 mm) above the finish floor.
- (3) Signage identifying accessible check-out aisles shall comply with Section 11-4.30.7 and shall be mounted above the check-out aisle in the same location where the check-out number or type of check-out is displayed.

- (4) All customer checkout aisles not required by this code to be accessible shall have at least 32 inches (813 mm) of clear passage.

11-7.4 Security bollards. Any device used to prevent the removal of shopping carts from store premises shall not prevent access or egress to people in wheelchairs. An alternate entry that is equally convenient to that provided for the ambulatory population is acceptable.

SECTION 11-8 LIBRARIES

11-8.1 General. In addition to the requirements of Sections 11-4.1 to 11-4.35, the design of all public areas of a library shall comply with Section 11-8, including reading and study areas, stacks, reference rooms, reserve areas, and special facilities or collections.

11-8.2 Reading and study areas. At least 5 percent or a minimum of one of each element of fixed seating, tables, or study carrels shall comply with Sections 11-4.2 and 11-4.32. Clearances between fixed accessible tables and between study carrels shall comply with Section 11-4.3.

11-8.3 Check-out areas. At least one lane at each check-out area shall comply with Section 11-7.2(1). Any traffic control or book security gates or turnstiles shall comply with Section 11-4.13.

11-8.4 Card catalogs and magazine displays. Minimum clear aisle space at card catalogs and magazine displays shall comply with Figure 55. Maximum reach height shall comply with Section 11-4.2, with a height of 48 inches (1219 mm) preferred irrespective of approach allowed.

11-8.5 Stacks. Minimum clear aisle width between stacks shall comply with Section 11-4.3, with a minimum clear aisle width of 42 inches (1065 mm) preferred where possible. Shelf height in stack areas is unrestricted (see Figure 56).

SECTION 11-9 ACCESSIBLE TRANSIENT LODGING

(1) Except as specified in the special technical provisions of this section, accessible transient lodging shall comply with the applicable requirements of Sections 11-4.1 through 11-4.35. Transient lodging includes facilities or portions thereof used for sleeping accommodations, when not classed as a medical care facility.

11-9.1 Hotels, motels, inns, boarding houses, dormitories, resorts and other similar places of transient lodging.

11-9.1.1 General. All public use and common use areas are required to be designed and constructed to comply with Section 11-4.

Exception: Sections 11-9.1 to 11-9.4 do not apply to an establishment located within a building that contains not more than five rooms for rent or hire and that is actually occupied by the proprietor of such establishment as the residence of such proprietor.

11-9.1.2 Accessible units, sleeping rooms, and suites. Accessible sleeping rooms or suites that comply with the requirements of Sections 11-9.2.1 to 11-9.2 shall be provided in conformance with the table below. In addition, in hotels, of 50 or more sleeping rooms or suites, additional accessible sleeping rooms or suites that include a roll-in shower shall also be provided in conformance with the table below. Such accommodations shall comply with the requirements of Sections 11-9.2, and 11-4.21, and Figure 57(a) or 57(b).

In all buildings, structures and facilities licensed as a hotel, motel or "resort condominium" pursuant to Chapter 509, *Florida Statutes*, a number of rooms equaling at least 5 percent of the guest rooms minus the number of Accessible rooms required by the table below shall provide the additional special accessibility features of Section 11-9.2.3.

11-9.1.3 Sleeping accommodations for persons with hearing impairments. In addition to those accessible sleeping rooms and suites required by Section 11-9.1.2, sleeping rooms and suites that comply with Section 11-9.3 shall be provided in conformance with the following table:

Number of Elements	Accessible Elements
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2% of total
1001 and over	20 plus 1 for each 100 over 1000

11-9.1.4 Classes of sleeping accommodations.

- (1) In order to provide persons with disabilities a range of options equivalent to those available to other persons served by the facility, sleeping rooms and suites required to be accessible by Section 11-9.1.2 shall be dispersed among the various classes of sleeping ac-

commodations available to patrons of the place of transient lodging. Factors to be considered include room size, cost, amenities provided, and the number of beds provided.

- (2) **Equivalent facilitation.** For purposes of this section, it shall be deemed equivalent facilitation if the operator of a facility elects to limit construction of accessible rooms to those intended for multiple occupancy, provided that such rooms are made available at the cost of a single occupancy room to an individual with disabilities who requests a single-occupancy room.

11-9.1.5 Alterations to accessible units, sleeping rooms, and suites. When sleeping rooms are being altered in an existing facility, or portion thereof, subject to the requirements of this section, at least one sleeping room or suite that complies with the requirements of Section 11-9.2 shall be provided for each of the 25 sleeping rooms, or fraction thereof, of rooms being altered until the number of such rooms provided equals the number required to be accessible with Section 11-9.1.2. In addition, at least one sleeping room or suite that complies with the requirements of Section 11-9.3 shall be provided for each of the 25 sleeping rooms, or fraction thereof, of rooms being altered until the number of such rooms equals the number required to be accessible by Section 11-9.1.3.

11-9.2 Requirements for accessible units, sleeping rooms and suites.

11-9.2.1 General. Units, sleeping rooms, and suites required to be accessible by Section 11-9.1 shall comply with Section 11-9.2.

11-9.2.2 Minimum requirements. An accessible unit, sleeping room or suite shall be on an accessible route complying with Section 11-4.3 and have the following accessible elements and spaces.

- (1) Accessible sleeping rooms shall have a 36 inch (915 mm) clear width maneuvering space located along both sides of a bed, except that where two beds are provided, this requirement can be met by providing a 36 inches (915 mm) wide maneuvering space located between the two beds.
- (2) An accessible route complying with Section 11-4.3 shall connect all accessible spaces and elements, including telephones, within the unit, sleeping room, or

Number of Rooms	Accessible Rooms	Rooms with Roll-in Showers
1 to 25	1	
26 to 50	2	
51 to 75	3	1
76 to 100	4	1
101 to 150	5	2
151 to 200	6	2
201 to 300	7	3
301 to 400	8	4
401 to 500	9	4, plus one for each additional 100 over 400
501 to 1000	2% of total	
1001 and over	20 plus 1 for each 100 over 1000	

Florida 5%

(See second paragraph of Section 11-9.1.2)

suite. This is not intended to require an elevator in multistory units as long as the spaces identified in Sections 11-9.2.2(6) and 11-9.2.2(7) are on accessible levels and the accessible sleeping area is suitable for dual occupancy.

- (3) Doors and doorways designed to allow passage into and within all sleeping rooms, suites or other covered units shall comply with Section 11-4.13.
- (4) If fixed or built-in storage facilities such as cabinets, shelves, closets, and drawers are provided in accessible spaces, at least one of each type provided shall contain storage space complying with Section 11-4.25. Additional storage may be provided outside of the dimensions required by Section 11-4.25.
- (5) All controls in accessible units, sleeping rooms, and suites shall comply with Section 11-4.27.
- (6) Where provided as part of an accessible unit, sleeping room, or suite, the following spaces shall be accessible and shall be on an accessible route:
 - (a) The living area.
 - (b) The dining area.
 - (c) At least one sleeping area.
 - (d) Patios, terraces, or balconies.

Exception: The requirements of Sections 11-4.13.8 and 11-4.3.8 do not apply where it is necessary to utilize a higher door threshold or a change in level to protect the integrity of the unit from wind/water damage. Where this exception results in patios, terraces or balconies that are not at an accessible level, equivalent facilitation shall be provided. (e.g., equivalent facilitation at a hotel patio or balcony might consist of providing raised decking or a ramp to provide accessibility).

- (e) At least one full bathroom (i.e., one with a water closet, a lavatory, and a bathtub or shower).
 - (f) If only half baths are provided, at least one-half bath.
 - (g) Carports, garages or parking spaces.
- (7) Kitchens, kitchenettes or wet bars: When provided as accessory to a sleeping room or suite, kitchens, kitchenettes, wet bars, or similar amenities shall be accessible. Clear floor space for a front or parallel approach to cabinets, counters, sinks, and appliances shall be provided to comply with Section 11-4.2.4. Countertops and sinks shall be mounted at a maximum height of 34 inches (865 mm) above the floor. At least 50 percent of shelf space in cabinets or refrigerator/freezers shall be within the reach ranges of Section 11-4.2.5 or 11-4.2.6 and space shall be designed to allow for the operation of cabinet and/or appliance doors so that all cabinets and appliances are accessible and usable. Controls and operating mechanisms shall comply with Section 11-4.27.

- (8) Sleeping room accommodations for persons with hearing impairments required by Section 11-9.1 and complying with Section 11-9.3 shall be provided in the accessible sleeping room or suite.

11-9.2.3 Hotel, motel and condominium special accessibility feature. Nothing in this section shall be construed as relieving the owner of the responsibility of providing accessible rooms in conformance with Sections 11-9.1 and 11-9.5 of the code.

In all buildings, structures and facilities licensed as a hotel, motel or resort condominium pursuant to Chapter 509, *Florida Statutes*, a number of rooms equaling at least 5 percent of the guest rooms minus the number of accessible rooms required by the table in Section 11-9.1.2 shall provide the following additional special accessibility features:

- (1) Grab rails in bathrooms and toilet rooms which comply with Section 11-4.16.4 of this code.
- (2) All beds in designed accessible guest rooms shall be open-frame type to permit passage of lift devices.
- (3) All standard water closet seats shall be at a height of 15 inches (381 mm), measured vertically from the finish floor to the top of the seat, with a variation of plus or minus 1/2 inch (12.7 mm). A portable or attached raised toilet seat shall be provided in all designated permanent disability accessible rooms.

11-9.3 Visual alarms, notification devices and telephones.

11-9.3.1 General. In sleeping rooms required to comply with this section, auxiliary visual alarms shall be provided and shall comply with Section 11-4.28.4. Visual notification devices shall also be provided in units, sleeping rooms and suites to alert room occupants of incoming telephone calls and a door knock or bell.

Notification devices shall not be connected to auxiliary visual alarm signal appliances. Permanently installed telephones shall have volume controls complying with Section 11-4.31.5; an accessible electrical outlet within 4 feet (1219 mm) of a telephone connection shall be provided to facilitate the use of a text telephone.

11-9.3.2 Equivalent facilitation. For purposes of this section, equivalent facilitation shall include the installation of electrical outlets (including outlets connected to a facility's central alarm system) and telephone wiring in sleeping rooms and suites to enable persons with hearing impairments to utilize portable visual alarms and communication devices provided by the operator of the facility.

11-9.4 Other sleeping rooms and suites. Doors and doorways designed to allow passage into and within all sleeping units or other covered units shall comply with Section 11-4.13.5.

11-9.5 Transient lodging in homeless shelters, halfway houses, transient group homes, and other social service establishments.

11-9.5.1 New construction. In new construction all public use and common use areas are required to be designed and constructed to comply with Section 11-4. At least

one of each type of amenity (such as washers, dryers and similar equipment installed for the use of occupants) in each common area shall be accessible and shall be located on an accessible route to any accessible unit or sleeping accommodation.

Exception: Where elevators are not provided as allowed in Section 11-4.13(5), accessible amenities are not required on inaccessible floors as long as one of each type is provided in common areas on accessible floors.

11-9.5.2 Alterations.

(1) Social service establishments which are not homeless shelters:

(a) The provisions of Sections 11-9.5.3 and 11-9.1.5 shall apply to sleeping rooms and beds.

(b) Alteration of other areas shall be consistent with the new construction provisions of Section 11-9.5.1.

(2) **Homeless shelters.** If the following elements are altered, the following requirements apply:

(a) At least one public entrance shall allow a person with mobility impairments to approach, enter and exit including a minimum clear door width of 32 inches (813 mm).

(b) Sleeping space for homeless persons as provided in the scoping provisions of Section 11-9.1.2 shall include doors to the sleeping area with a minimum clear width of 32 inches (813 mm) and maneuvering space around the beds for persons with mobility impairments complying with Section 11-9.2.2(1).

(c) At least one toilet room for each gender or one unisex toilet room shall have a minimum clear door width of 32 inches (813 mm), minimum turning space complying with Section 11-4.2.3, one water closet complying with Section 11-4.16, one lavatory complying with Section 11-4.19 and the door shall have a privacy latch; and, if provided, at least one tub or shower shall comply with Section 11-4.20 or 11-4.21, respectively.

(d) At least one common area which a person with mobility impairments can approach, enter and exit including a minimum clear door width of 32 inches (813 mm).

(e) At least one route connecting elements Sections 11-9.5.2(2)(a), 11-9.5.2(2)(b), 11-9.5.2(2)(c), 11-9.5.2(2)(d), which a person with mobility impairments can use, including minimum clear width of 36 inches (914 mm), passing space complying with Section 11-4.3.4, turning space complying with Section 11-4.2.3 and changes in levels complying with Section 11-4.3.8.

(f) Homeless shelters can comply with the provisions of Sections 11-9.5.2(2)(a) through 11-9.5.2(2)(e) by providing the above elements on one accessible floor.

11-9.5.3 Accessible sleeping accommodations in new construction. Accessible sleeping rooms shall be provided in conformance with the table in Section 11-9.1.2 and shall comply with Section 11-9.2 (where the items are provided). Additional sleeping rooms that comply with Section 11-9.3 shall be provided in conformance with the table provided in Section 11-9.1.3.

In facilities with multibed rooms or spaces, a percentage of the beds equal to the table provided in Section 11-9.1.2 shall comply with Section 11-9.2.2(1).

SECTION 11-10 TRANSPORTATION FACILITIES

11-10.1 General. Every station, bus stop, bus stop pad, terminal, building or other transportation facility, shall comply with the applicable provisions of Sections 11-4.1 through 11-4.35, Sections 11-5 through 11-9, and the applicable provisions of this section. The exceptions for elevators in Section 11-4.1.3(5), Exception 1 and Section 11-4.1.6(1)(k) do not apply to a terminal, depot, or other station used for specified public transportation, or an airport passenger terminal, or facilities subject to Title II.

11-10.2 Bus stops and terminals.

11-10.2.1 New construction.

(1) Where new bus stop pads are constructed at bus stops, bays or other areas where a lift or ramp is to be deployed, they shall have a firm, stable surface; a minimum clear length of 96 inches (2438 mm) (measured from the curb or vehicle roadway edge) and minimum clear width of 60 inches (1524 mm) (measured parallel to the vehicle roadway) to the maximum extent allowed by legal or site constraints; and shall be connected to streets, sidewalks or pedestrian paths by an accessible route complying with Sections 11-4.3 and 11-4.4. The slope of the pad parallel to the roadway shall, to the extent practicable, be the same as the roadway. For water drainage, a maximum slope of 1:50 (2 percent) perpendicular to the roadway is allowed.

(2) Where provided, new or replaced bus shelters shall be installed or positioned so as to permit a wheelchair or mobility aid user to enter from the public way and to reach a location, having a minimum clear floor area of 30 inches by 48 inches (762 mm by 1219 mm), entirely within the perimeter of the shelter. Such shelters shall be connected by an accessible route to the boarding area provided under paragraph Section 11-10.2.1(1) of this section.

(3) Where provided, all new bus route identification signs shall comply with Section 11-4.30.5. In addition, to the maximum extent practicable, all new bus route identification signs shall comply with Sections

11-4.30.2 and 11-4.30.3. Signs that are sized to the maximum dimensions permitted under legitimate local, state or federal regulations or ordinances shall be considered in compliance with Sections 11-4.30.2 and 11-4.30.3 for purposes of this section.

Exception: Bus schedules, timetables, or maps that are posted at the bus stop or bus bay are not required to comply with this provision.

11-10.2.2 Bus stop siting and alterations.

- (1) Bus stop sites shall be chosen such that, to the maximum extent practicable, the areas where lifts or ramps are to be deployed comply with Sections 11-10.2.1(1) and 11-10.2.1(2).
- (2) When new bus route identification signs are installed or old signs are replaced, they shall comply with the requirements of Section 11-10.2.1(3).

11-10.3 Fixed facilities and stations.

11-10.3.1 New construction. New stations in rapid rail, light rail, commuter rail, intercity bus, intercity rail, high-speed rail, and other fixed guideway systems (e.g., automated guideway transit, monorails, etc.) shall comply with the following provisions, as applicable:

- (1) Elements such as ramps, elevators or other circulation devices, fare vending or other ticketing areas, and fare collection areas shall be placed to minimize the distance which wheelchair users and other persons who cannot negotiate steps may have to travel compared to the general public. The circulation path, including an accessible entrance and an accessible route, for persons with disabilities shall, to the maximum extent practicable, coincide with the circulation path for the general public. Where the circulation path is different, signage complying with Sections 11-4.30.1, 11-4.30.2, 11-4.30.3, 11-4.30.5, and 11-4.30.7(1) shall be provided to indicate direction to and identify the accessible entrance and accessible route.
- (2) In lieu of compliance with Section 11-4.1.3(8), at least one entrance to each station shall comply with Section 11-4.14. If different entrances to a station serve different transportation fixed routes or groups of fixed routes, at least one entrance serving each group or route shall comply with Section 11-4.14. All accessible entrances shall, to the maximum extent practicable, coincide with those used by the majority of the general public.
- (3) Direct connections to commercial, retail, or residential facilities shall have an accessible route complying with Section 11-4.3 from the point of connection to boarding platforms and all transportation system elements used by the public. Any elements provided to facilitate future direct connections shall be on an accessible route connecting boarding platforms and all transportation system elements used by the public.
- (4) Where signs are provided at entrances to stations identifying the station or the entrance, or both, at

least one sign and entrance shall comply with Sections 11-4.30.4 and 11-4.30.6. Such signs shall be placed in uniform locations at entrances within the transit system to the maximum extent practicable.

Exception: Where the station has no defined entrance, but signage is provided, then the accessible signage shall be placed in a central location.

- (5) Stations covered by this section shall have identification signs complying with Sections 11-4.30.1, 11-4.30.2, 11-4.30.3, and 11-4.30.5. Signs shall be placed at frequent intervals and shall be clearly visible from within the vehicle on both sides when not obstructed by another train. When station identification signs are placed close to vehicle windows (i.e., on the side opposite from boarding) each shall have the top of the highest letter or symbol below the top of the vehicle window and the bottom of the lowest letter or symbol above the horizontal midline of the vehicle window.
- (6) Lists of stations, routes, or destinations served by the station and located on boarding areas, platforms, or mezzanines shall comply with Sections 11-4.30.1, 11-4.30.2, 11-4.30.3, and 11-4.30.5. A minimum of one sign identifying the specific station and complying with Sections 11-4.30.4 and 11-4.30.6 shall be provided on each platform or boarding area. All signs referenced in this paragraph shall, to the maximum extent practicable, be placed in uniform locations within the transit system.
- (7) Automatic fare vending, collection and adjustment (e.g., add-fare) systems shall comply with Sections 11-4.34.2, 11-4.34.3, 11-4.34.4, and 11-4.34.5. At each accessible entrance such devices shall be located on an accessible route. If self-service fare collection devices are provided for the use of the general public, at least one accessible device for entering, and at least one for exiting, unless one device serves both functions, shall be provided at each accessible point of entry or exit. Accessible fare collection devices shall have a minimum clear opening width of 32 inches (813 mm); shall permit passage of a wheelchair; and, where provided, coin or card slots and controls necessary for operation shall comply with Section 11-4.27. Gates which must be pushed open by wheelchair or mobility aid users shall have a smooth continuous surface extending from 2 inches (51 mm) above the floor to 27 inches (686 mm) above the floor and shall comply with Section 11-4.13. Where the circulation path does not coincide with that used by the general public, accessible fare collection systems shall be located at or adjacent to the accessible point of entry or exit.
- (8) Platform edges bordering a drop-off and not protected by platform screens or guard rails shall have a detectable warning. Such detectable warnings shall comply with Section 11-4.29.2 and shall be 24 inches (610 mm) wide running the full length of the platform drop-off.

(9) In stations covered by this section, rail-to-platform height in new stations shall be coordinated with the floor height of new vehicles so that the vertical difference, measured when the vehicle is at rest, is within plus or minus $\frac{5}{8}$ inch (16 mm) under normal passenger load conditions. For rapid rail, light rail, commuter rail, high speed rail, and intercity rail systems in new stations, the horizontal gap, measured when the new vehicle is at rest, shall be no greater than 3 inches (76 mm). For slow-moving automated guideway “people mover” transit systems, the horizontal gap in new stations shall be no greater than 1 inch (25 mm).

Exceptions:

1. Existing vehicles operating in new stations may have a vertical difference with respect to the new platform within plus or minus $1\frac{1}{2}$ inch (38 mm).
 2. In light rail, commuter rail and intercity rail systems where it is not operationally or structurally feasible to meet the horizontal gap or vertical difference requirements, minihigh platforms, car-borne or platform-mounted lifts, ramps or bridge plates, or similar manually deployed devices, meeting the applicable requirements of 36 C.F.R. Part 1192, or 49 C.F.R. Part 38 shall suffice.
- (10) Stations shall not be designed or constructed so as to require persons with disabilities to board or alight from a vehicle at a location other than one used by the general public.
- (11) Illumination levels in the areas where signage is located shall be uniform and shall minimize glare on signs. Lighting along circulation routes shall be of a type and configuration to provide uniform illumination.
- (12) **Text telephones:** The following shall be provided in accordance with Section 11-4.31.9:
- (a) If an interior public pay telephone is provided in a transit facility (as defined by the Department of Transportation) at least one interior public text telephone shall be provided in the station.
 - (b) Where four or more public pay telephones serve a particular entrance to a rail station and at least one is in an interior location, at least one interior public text telephone shall be provided to serve that entrance. Compliance with this section constitutes compliance with Section 11-4.1.3(17)(c).
- (13) Where it is necessary to cross tracks to reach boarding platforms, the route surface shall be level and flush with the rail top at the outer edge and between rails, except for a maximum $2\frac{1}{2}$ -inch (64 mm) gap on the inner edge of each rail to permit passage of wheel flanges. Such crossings shall comply with Section 11-4.29.5. Where gap reduction is not prac-

ticable, an above-grade or below-grade accessible route shall be provided.

- (14) Where public address systems are provided to convey information to the public in terminals, stations, or other fixed facilities, a means of conveying the same or equivalent information to persons with hearing loss or who are deaf shall be provided.
- (15) Where clocks are provided for use by the general public, the clock face shall be uncluttered so that its elements are clearly visible. Hands, numerals, and/or digits shall contrast with the background either light on dark or dark on light. Where clocks are mounted overhead, numerals and/or digits shall comply with Section 11-4.30.3. Clocks shall be placed in uniform locations throughout the facility and system to the maximum extent practicable.
- (16) Where provided in below grade stations, escalators shall have a minimum clear width of 32 inches (813 mm). At the top and bottom of each escalator run, at least two contiguous treads shall be level beyond the comb plate before the risers begin to form. All escalator treads shall be marked by a strip of clearly contrasting color, 2 inches (51 mm) in width, placed parallel to and on the nose of each step. The strip shall be of a material that is at least as slip resistant as the remainder of the tread. The edge of the tread shall be apparent from both ascending and descending directions.
- (17) Where provided, elevators shall be glazed or have transparent panels to allow an unobstructed view both into and out of the car. Elevators shall comply with Section 11-4.10.

Exception: Elevator cars with a clear floor area in which a 60-inch (1524 mm) diameter circle can be inscribed may be substituted for the minimum car dimensions of Section 11-4.10 and Figure 22.

- (18) Where provided, ticketing areas shall permit persons with disabilities to obtain a ticket and check baggage and shall comply with Section 11-7.2.
- (19) Where provided, baggage check-in and retrieval systems shall be on an accessible route complying with Section 11-4.3, and shall have space immediately adjacent complying with Section 11-4.2. If unattended security barriers are provided, at least one gate shall comply with Section 11-4.13. Gates which must be pushed open by wheelchair or mobility aid users shall have a smooth continuous surface extending from 2 inches (51 mm) above the floor to 27 inches (686 mm) above the floor.

11-10.3.2 Existing facilities: Key stations.

- (1) Rapid, light and commuter rail key stations, as defined under criteria established by the Department of Transportation in Subpart C or 49 CFR Part 37 and existing intercity rail stations shall provide at least one accessible route from an accessible entrance to those areas necessary for use of the transportation system.

- (2) The accessible route required by Section 11-10.3.2(1) shall include the features specified in Section 11-10.3.1(1), Sections 11-10.3.1(4) through 11-10.3.1(9), Sections 11-10.3.1(11) through 11-10.3.1(15), and Sections 11-10.3.1(17) through 11-10.3.1(19).
- (3) Where technical infeasibility in existing stations requires the accessible route to lead from the public way to paid area of the transit system, an accessible fare collection system, complying with Section 11-10.3.1(7), shall be provided along such accessible route.
- (4) In light rail, rapid rail and commuter rail key stations, the platform or a portion thereof and the vehicle floor shall be coordinated so that the vertical difference, measured when the vehicle is at rest, within plus or minus 1½ inches (38 mm) under all normal passenger load conditions, and the horizontal gap, measured when the vehicle is at rest, is not greater than 3 inches (76 mm) for at least one door of each vehicle or car required to be accessible by 49 CFR Part 37.

Exceptions:

- 1. Existing vehicles retrofitted to meet the requirements of 49 CFR 37.93 (one-car-per-trail rule) shall be coordinated with the platform such that, for at least one door, the vertical difference between the vehicle floor and the platform, measured when the vehicle is at rest with 50-percent normal passenger capacity, is within plus or minus 2 inches (51 mm) and the horizontal gap is no greater than 4 inches (102 mm).
 - 2. Where it is not structurally or operationally feasible to meet the horizontal gap or vertical difference requirements, mini-high platforms, car-borne or platform mounted lifts, ramps or bridge plates, or similar manually deployed devices, meeting the applicable requirements of 36 CFR Part 1192, 49 CFR Part 38, shall suffice.
- (5) New direct connections to commercial, retail, or residential facilities shall, to the maximum extent feasible, have an accessible route complying with Section 11-4.3 from the point of connection to boarding platforms and all transportation system elements used by the public. Any elements provided to facilitate future direct connections shall be on an accessible route connecting boarding platforms and all transportation system elements used by the public.

11-10.3.3 Existing facilities: Alterations.

- (1) For the purpose of complying with Section 11-4.1.6(2) an area of primary function shall be as defined by applicable provisions of 49 CFR 37.43(c) (Department of Transportation’s ADA Rule) or 28 CFR 36.403 (Department of Justice’s ADA Rule).

11-10.4 Airports.

11-10.4.1 New construction.

- (1) Elements such as ramps, elevators or other vertical circulation devices, ticketing areas, security checkpoints, or passenger waiting areas shall be placed to minimize the distance which wheelchair users and other persons who cannot negotiate steps may have to travel compared to the general public.
- (2) The circulation path, including an accessible entrance and an accessible route, for persons with disabilities shall, to the maximum extent practicable, coincide with the circulation path for the general public. Where the circulation path is different, directional signage complying with Sections 11-4.30.1, 11-4.30.2, 11-4.30.3 and 11-4.30.5 shall be provided which indicates the location of the nearest accessible entrance and its accessible route.
- (3) Ticketing areas shall permit persons with disabilities to obtain a ticket and check baggage and shall comply with Section 11-7.2.
- (4) Where public telephones are provided, and at least one is at an interior location, a public text telephone shall be provided in compliance with Section 11-4.31.9. Additionally, if four or more public pay telephones are located any of the following locations, at least one public text telephone shall also be provided in that location:
 - (a) A main terminal outside the security areas;
 - (b) A concourse within the security areas; or
 - (c) A baggage claim area in a terminal. Compliance with this section constitutes compliance with Section 11-4.1.3(17)(c).
- (5) Baggage check-in and retrieval systems shall be on an accessible route complying with Section 11-4.3, and shall have space immediately adjacent complying with Section 11-4.2.4. If unattended security barriers are provided, at least one gate shall comply with Section 11-4.13. Gates which must be pushed open by wheelchair or mobility aid users shall have a smooth continuous surface extending from 2 inches (51 mm) above the floor to 27 inches (686 mm) above the floor.
- (6) Terminal information systems which broadcast information to the general public through a public address system shall provide a means to provide the same or equivalent information to persons with a hearing loss or who are deaf. Such methods may include, but are not limited to, visual paging systems using video monitors and computer technology. For persons with certain types of hearing loss such methods may include, but are not limited to, an assistive listening system complying with Section 11-4.33.7.
- (7) Where clocks are provided for use by the general public the clock face shall be uncluttered so that its elements are clearly visible. Hands, numerals, and/or digits shall contrast with their background either light on dark or dark on light. Where clocks are

mounted over head, numerals and/or digits shall comply with Section 11-4.30.3. Clocks shall be placed in uniform locations throughout the facility to the maximum extent practicable.

(8) Security systems. Reserved.

11-10.5 Boat and ferry docks. Reserved.

SECTION 11-11 RESIDENTIAL BUILDINGS

11-11.1 Accessibility residential housing, Florida. Reserved.






- (1) All new single-family houses, duplexes, triplexes, condominiums, and townhouses shall provide at least one bathroom, located with maximum possible privacy, where bathrooms are provided on habitable grade levels, with a door that has a 29-inch (737 mm) clear opening. However, if only a toilet room is provided at grade level, such toilet rooms shall have a clear opening of not less than 29 inches (737 mm).
- (2) Buildings, structures, or facilities being converted from residential to nonresidential or mixed use shall comply with the requirements of Section 11-4.1.6.

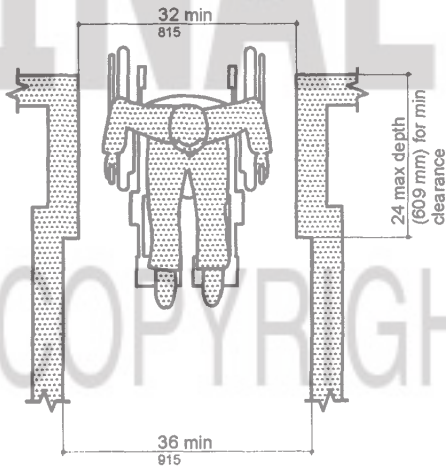
SECTION 11-12 THEME PARK OR AN ENTERTAINMENT COMPLEX

- (1) A theme park or an entertainment complex [as defined in Section 509.013(9) *Florida Statutes*, see definitions] in which are provided continuous attendant services for directing individuals to marked accessible parking spaces or designated lots for parking by persons who have disabilities, the park or complex may, in lieu of the required parking space design (see Section 11-4.6), provide parking spaces that comply with the alternative design of Figure 9(b). When the alternative parking space designs are used, van accessible spaces shall be provided in compliance with Section 11-4.1.2(5)(b) of this code. Accessible parking spaces shall be at least 96 inches (2440 mm) wide. Parking access aisles shall be part of an accessible route to the building or facility entrance and shall comply with Section 11-4.3. Two accessible parking spaces may share a common access aisle [see Figure 9(a) and Figure 9(b)]. Parking vehicle overhangs shall not reduce the clear width of an accessible route. Parking spaces and access aisles shall be level with surface slopes not exceeding 1:50 (2 percent) in all directions.
- (2) If a theme park or an entertainment complex [as defined in Section 509.013(9), *Florida Statutes*], provides parking in several lots or areas from which access to the theme park or entertainment complex is provided, a single lot or area may be designated for parking by persons who have disabilities, if the lot or area is located on the shortest safely accessible route to an accessible entrance to the theme park or entertainment complex or to transportation to such an accessible entrance.

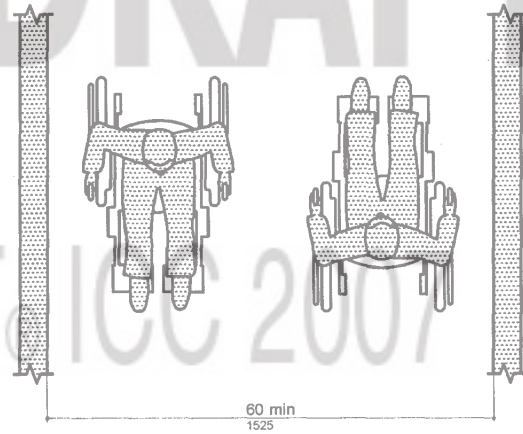
**TABLE 1
GRAPHIC CONVENTIONS**

Table 1
Graphic Conventions

Convention	Description
	Typical dimension line showing U.S. customary units (in inches) above the line and SI units (in millimeters) below.
	Dimensions for short distances indicated on arrow.
	Dimensions line for showing range of dimension
	Direction of approach
max	Maximum
min	Minimum
	Boundary of clear floor area
CL	Centerline



**FIGURE 1
MINIMUM CLEAR WIDTH
FOR SINGLE WHEELCHAIR**



**FIGURE 2
MINIMUM CLEAR WIDTH
FOR TWO WHEELCHAIRS**

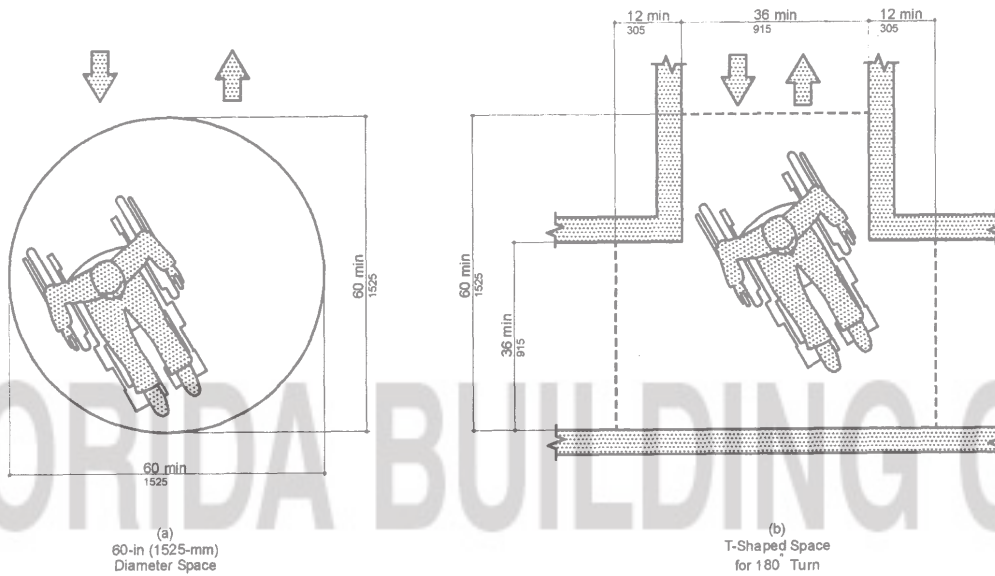


FIGURE 3
WHEELCHAIR TURNING SPACE

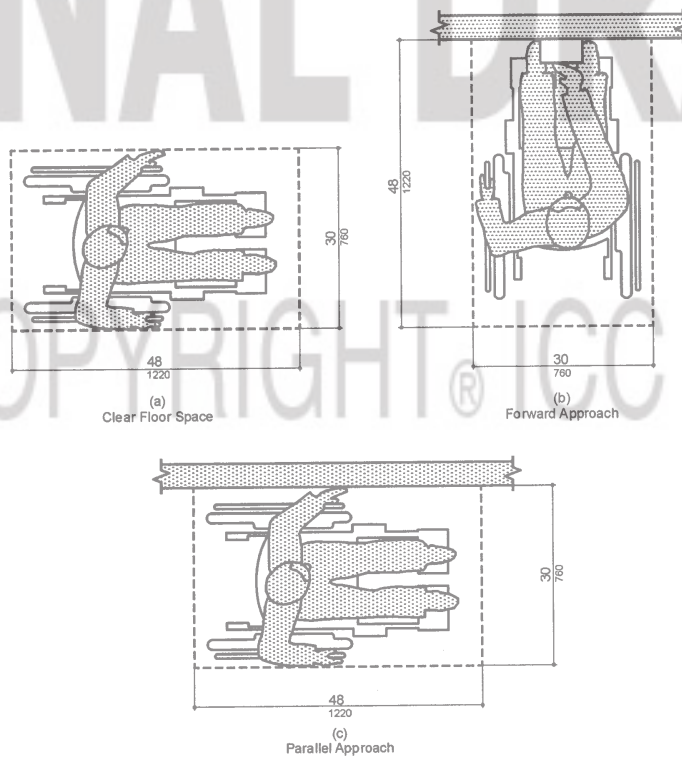
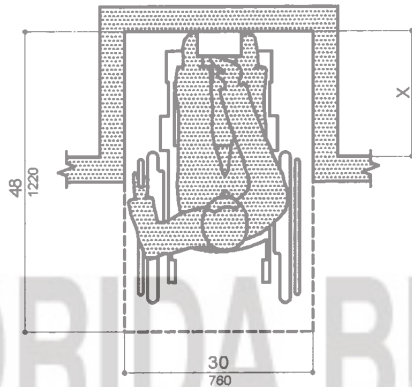
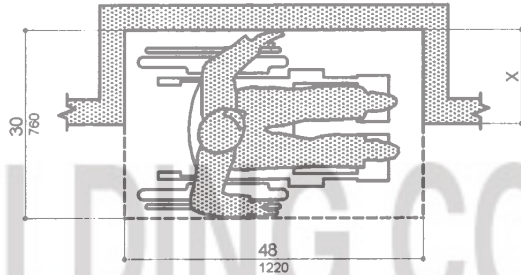


FIGURE 4
MINIMUM CLEAR FLOOR SPACE FOR WHEELCHAIRS

FLOIDA BUILDING CODE



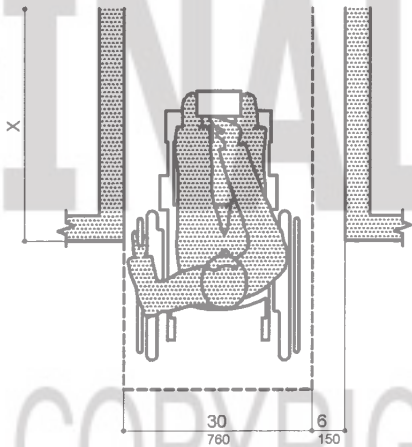
NOTE: $X \leq 24$ in. (610 mm)



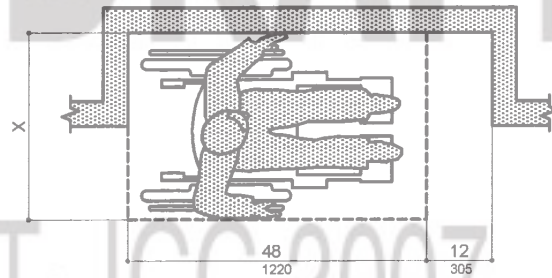
NOTE: $X \leq 15$ in. (380 mm)

(d)
CLEAR FLOOR SPACE IN ALCOVES

FINAL DRAFT



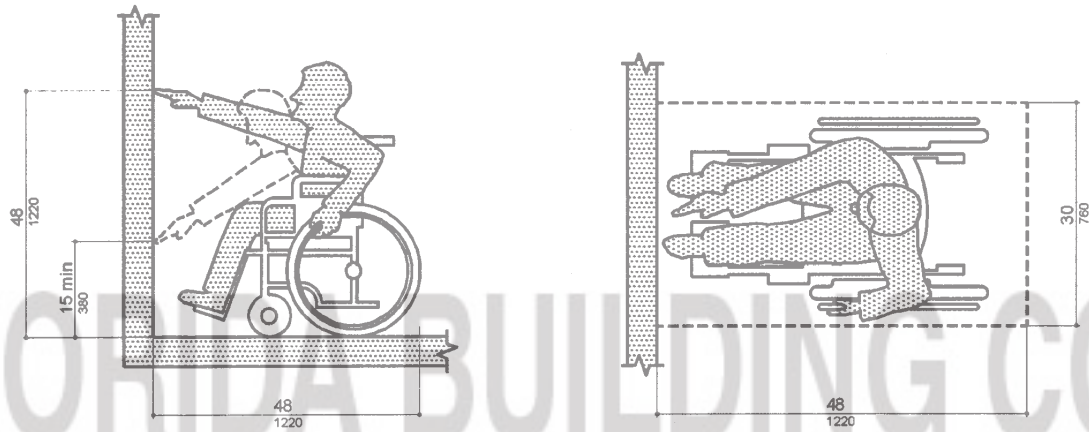
NOTE: IF $X > 24$ in. (610 mm), THEN AN ADDITIONAL MANEUVERING CLEARANCE OF 6 in. (150 mm) SHALL BE PROVIDED AS SHOWN.



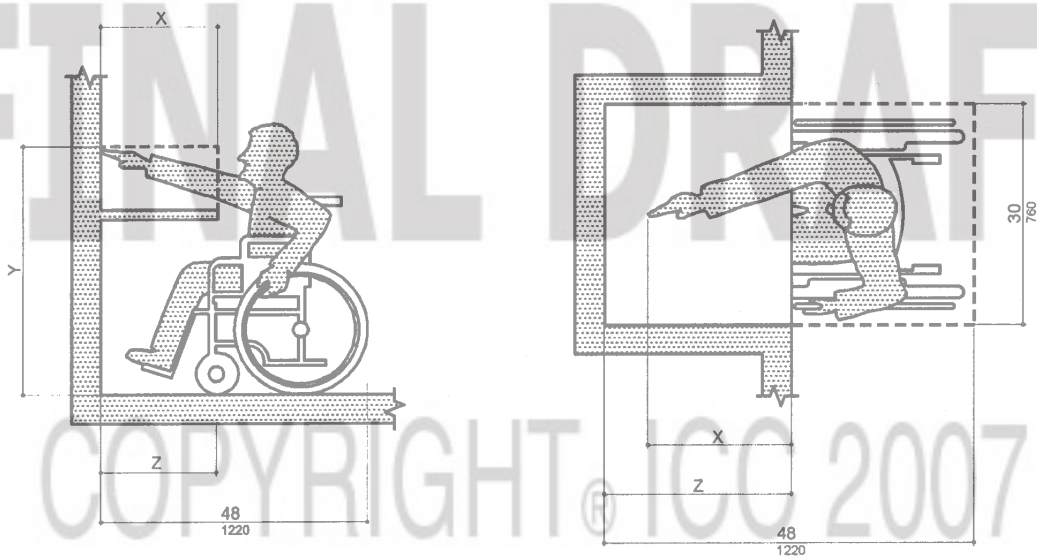
NOTE: IF $X > 15$ in. (380 mm), THEN AN ADDITIONAL MANEUVERING CLEARANCE OF 12 in. (305 mm) SHALL BE PROVIDED AS SHOWN.

(e)
ADDITIONAL MANEUVERING CLEARANCES FOR ALCOVES

FIGURE 4 (continued)
MINIMUM CLEAR FLOOR SPACE FOR WHEELCHAIRS



(a)
High Forward Reach Limit



NOTE: X SHALL BE \leq 25 in. (635 mm); Z SHALL BE \geq X. WHEN X < 20 in. (510 mm), THEN Y SHALL BE 48 in. (1220 mm) MAXIMUM. WHEN X IS 20 TO 25 in. (510 mm TO 635 mm), THEN Y SHALL BE 44 in. (1120 mm) MAXIMUM.

(b)
Maximum Forward Reach Over an Obstruction

**FIGURE 5
FORWARD REACH**

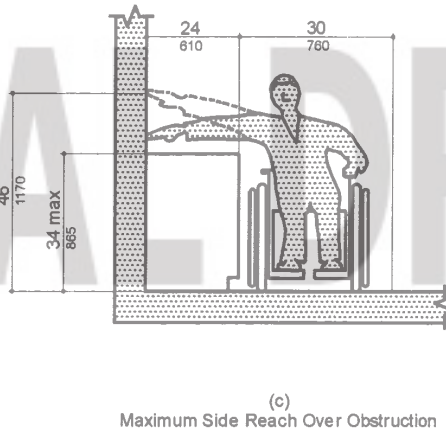
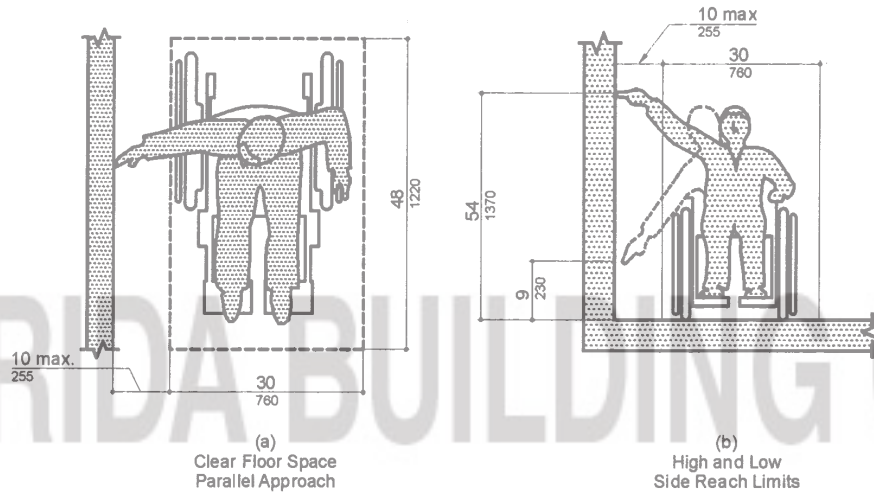
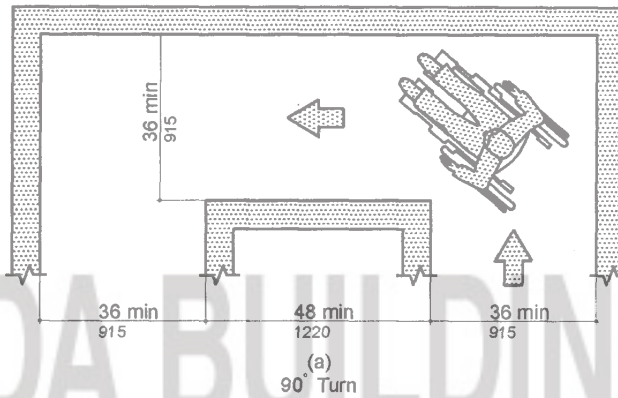


FIGURE 6
SIDE REACH

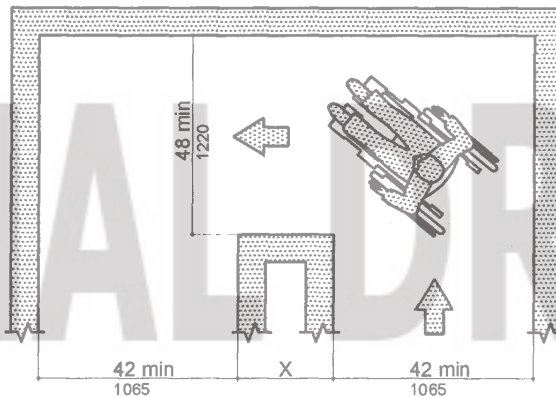
FLORIDA BUILDING CODE

FINAL DRAFT

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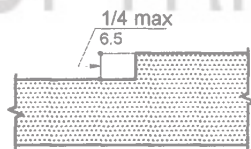


(a)
90° Turn

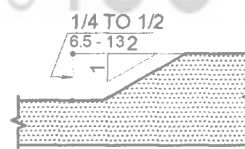


NOTE: Dimensions shown apply when X < 48 in. (1220 mm)

(b)
Turns Around an Obstruction



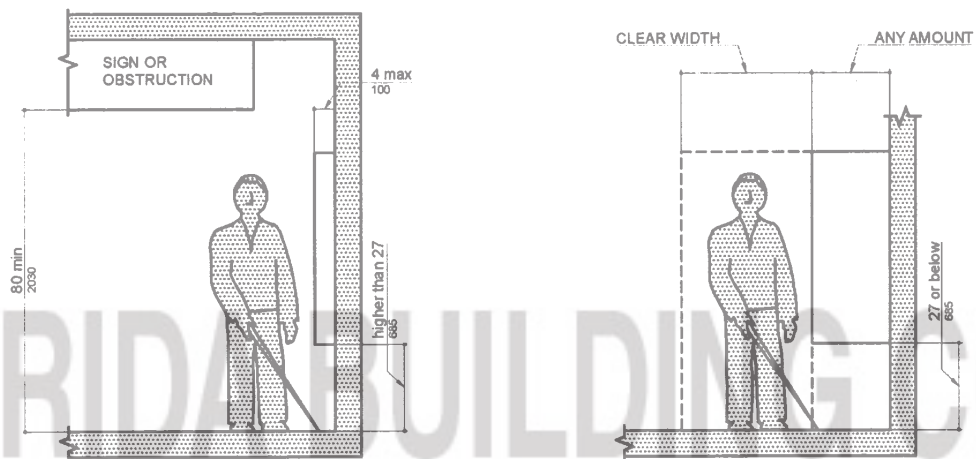
(c)
Changes in Level



(d)
Changes in Level

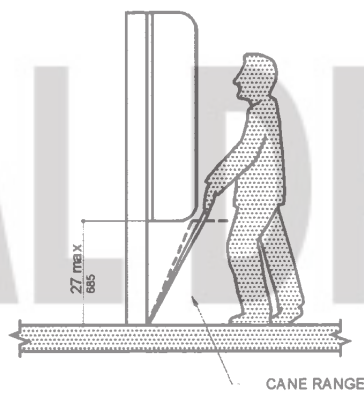
FIGURE 7
ACCESSIBLE ROUTE

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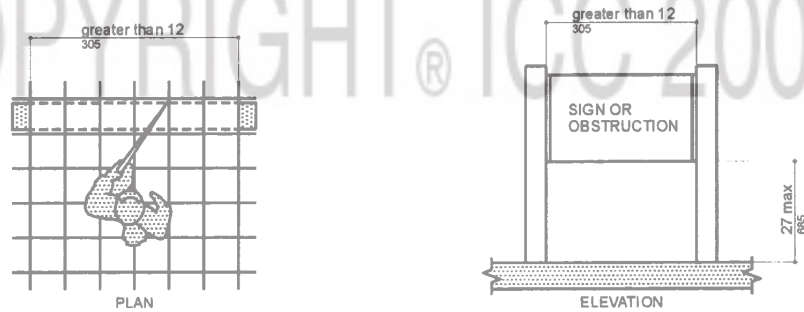
(a)
Walking Parallel to a Wall

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(b)
Walking Perpendicular to a Wall

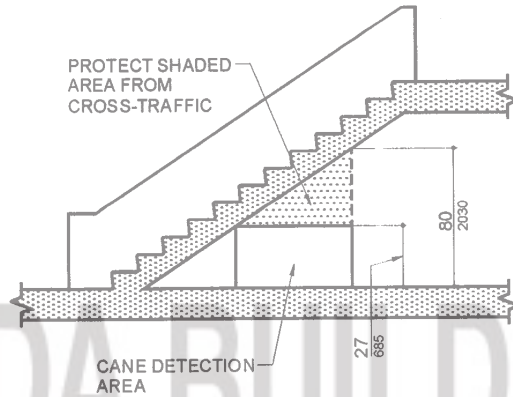
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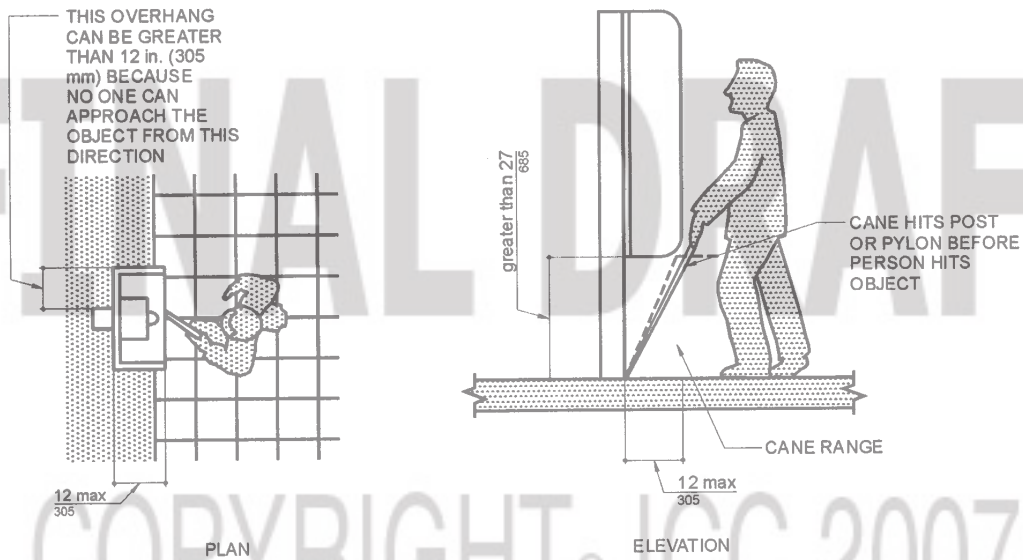
(c)
Free-Standing Overhanging Objects

**FIGURE 8
PROTRUDING OBJECTS**

FLORIDA BUILDING CODE

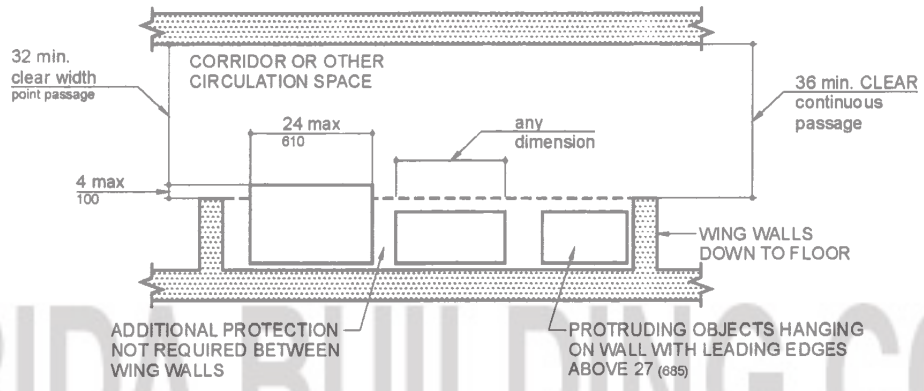


(c-1)
Overhead Hazards

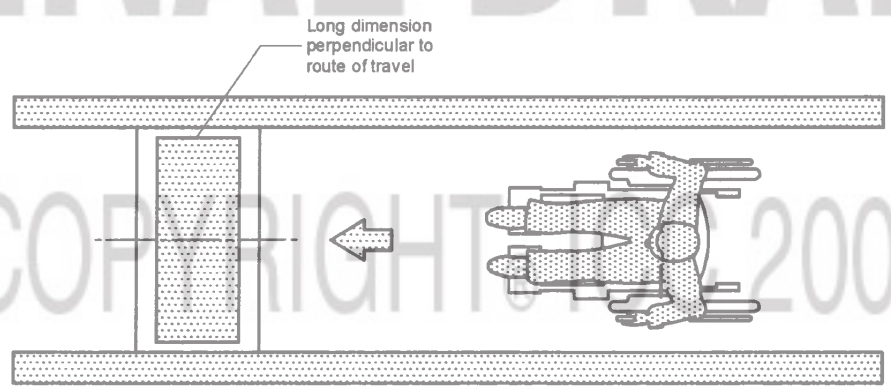
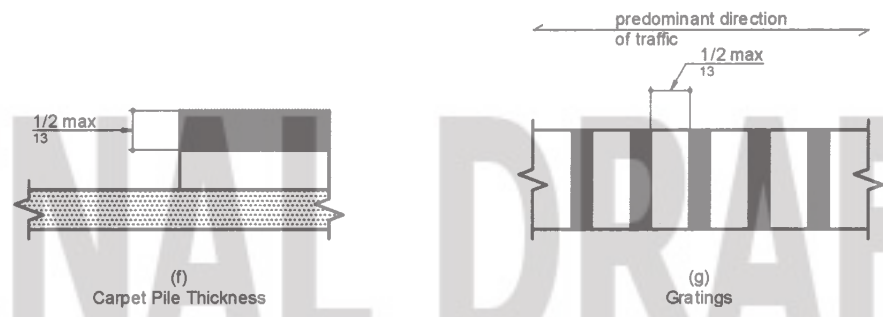


(d)
Objects Mounted on Posts or Pylons

FIGURE 8
PROTRUDING OBJECTS (continued)



(e)
Example of Protection Around Wall-Mounted Objects and Measurements of Clear Widths



(h)
Grating Orientation

FIGURE 8
PROTRUDING OBJECTS (continued)

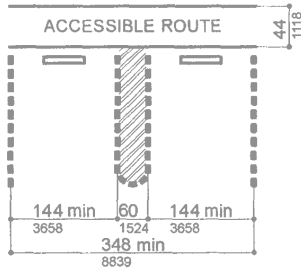


FIGURE 9(A)
STANDARDS PARKING SPACE DESIGN

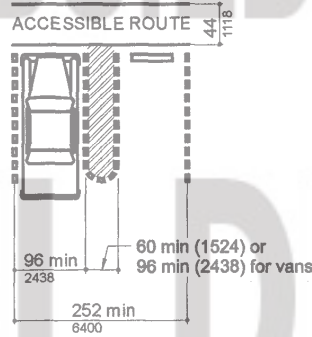


FIGURE 9(B)
ALTERNATIVE PARKING SPACES FOR
THEME PARK AND ENTERTAINMENT COMPLEX ONLY

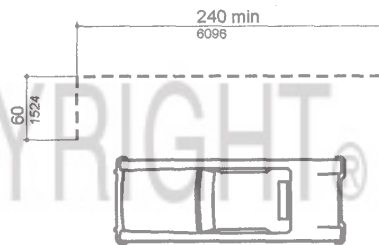


FIGURE 10
ACCESS AISLE AT PASSENGER LOADING ZONES

ADJOINING SLOPE
SHALL NOT
EXCEED 1:20

SLOPE = Y : X
WHERE X IS A
LEVEL PLANE

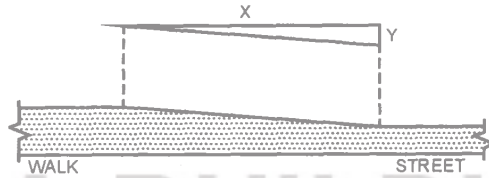


FIGURE 11
MEASUREMENT OF CURB RAMP SLOPES

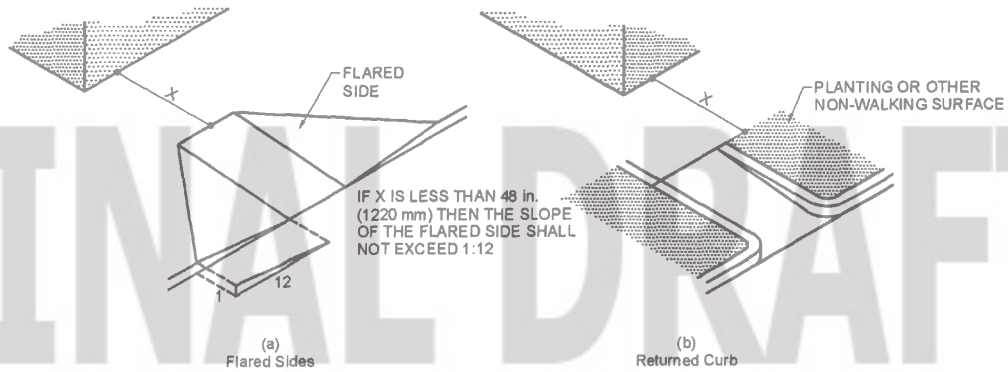


FIGURE 12
SIDES OF CURB RAMP

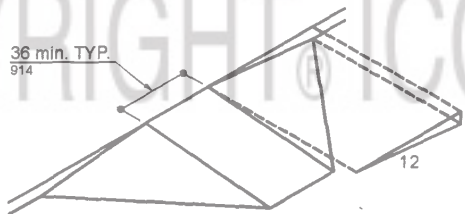


FIGURE 13
BUILT-UP CURB RAMP

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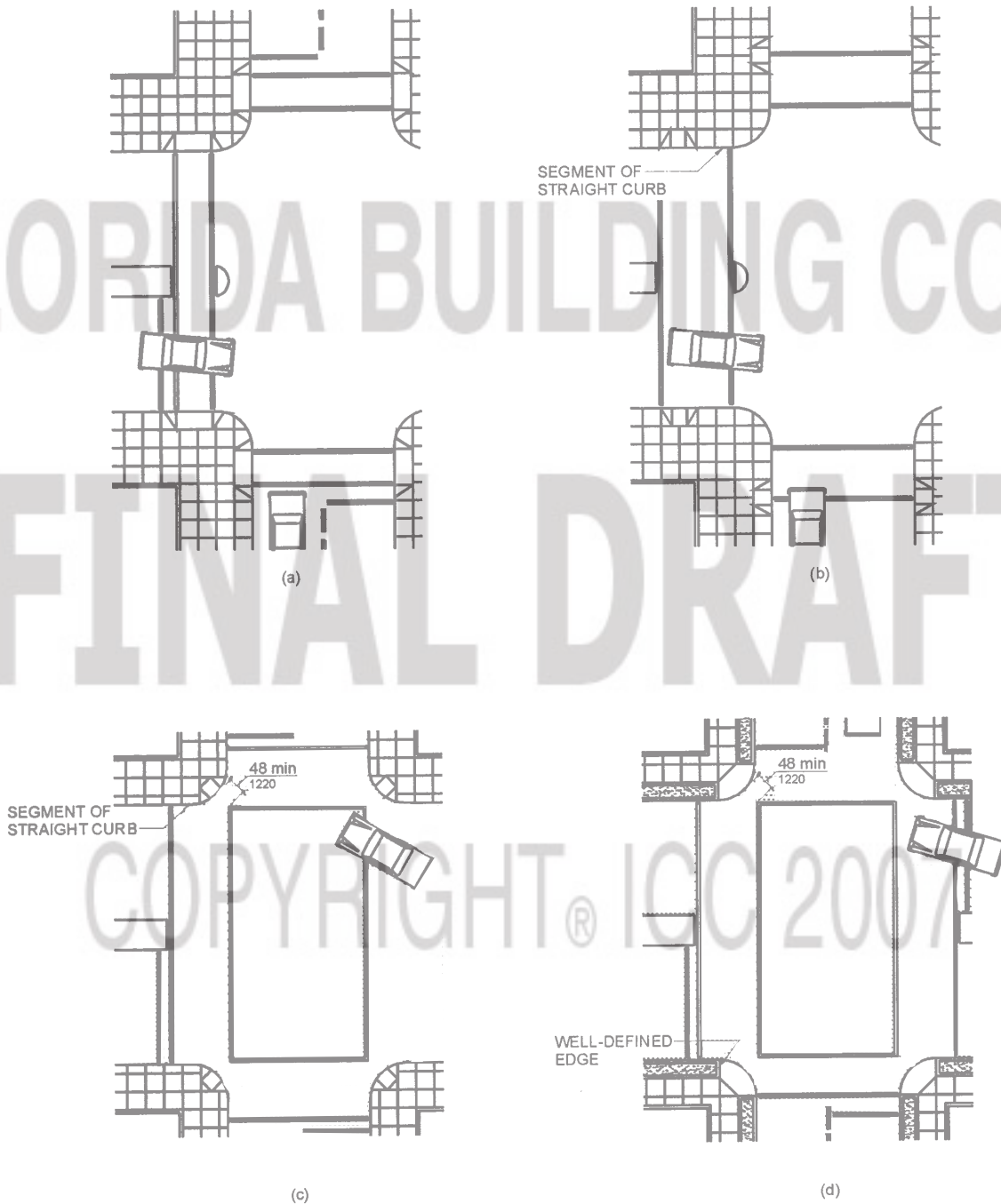
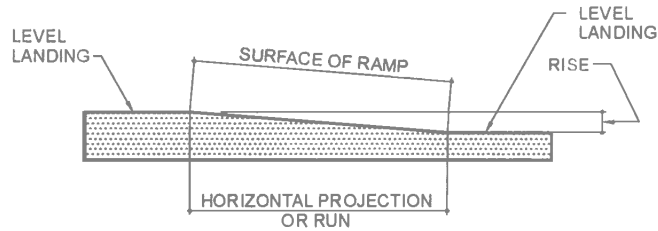


FIGURE 15
CURB RAMPS AT MARKED CROSSINGS



Slope	Maximum Rise		Maximum Horizontal Projection	
	in.	mm	ft	m
1:12 to < 1:16	30	760	30	9
1:16 to < 1:20	30	760	40	12

FIGURE 16
COMPONENTS OF A SINGLE RAMP RUN AND SAMPLE RAMP DIMENSIONS

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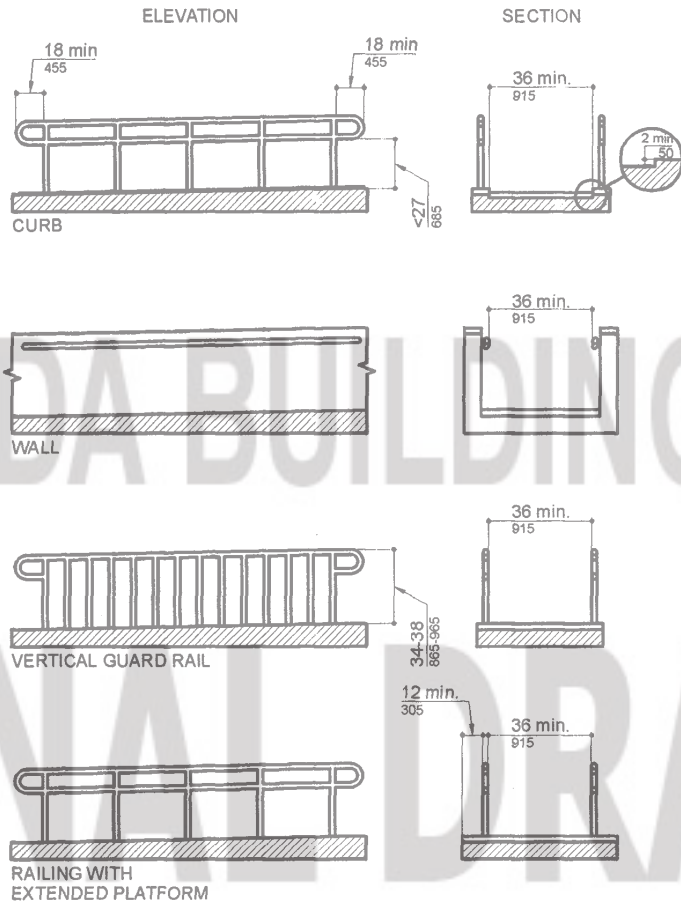


FIGURE 17
 EXAMPLES OF EDGE PROTECTION AND HANDRAIL EXTENSIONS

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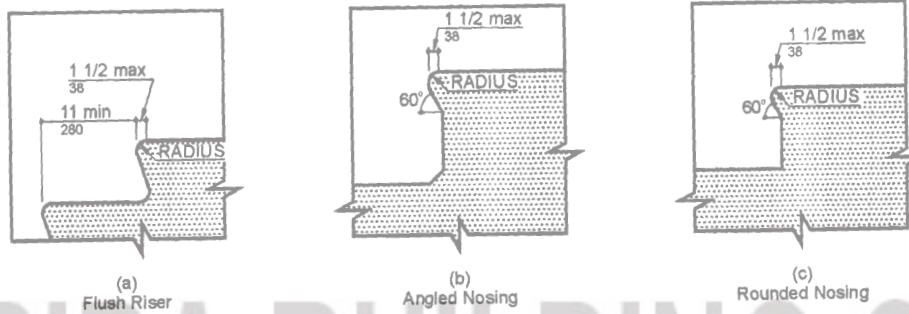


FIGURE 18
USABLE TREAD WIDTH AND EXAMPLES OF ACCEPTABLE NOSINGS

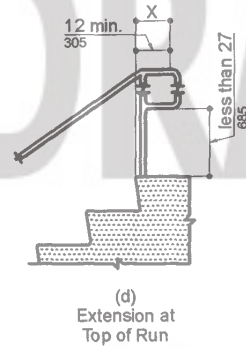
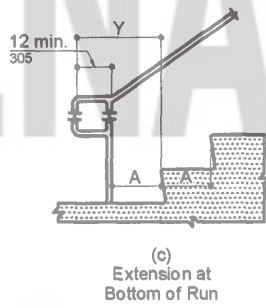
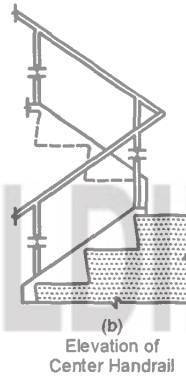
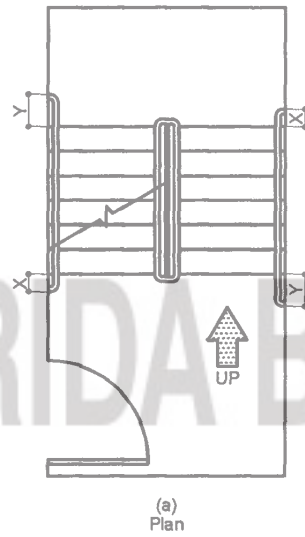
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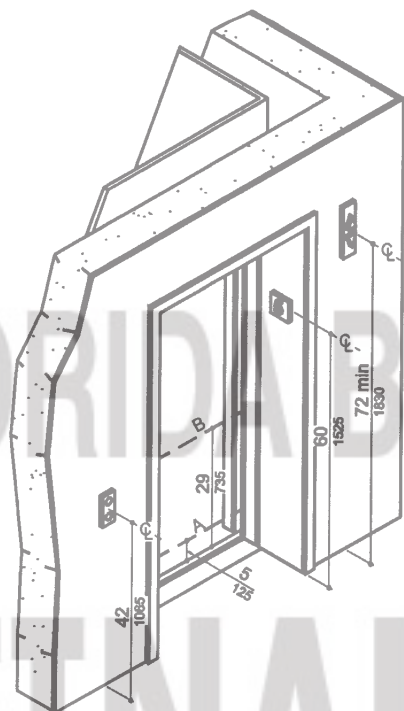
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NOTE X IS THE 12 IN. MINIMUM HANDRAIL EXTENSION REQUIRED AT EACH TOP RISER
Y IS THE MINIMUM HANDRAIL EXTENSION OF 12 IN. PLUS THE WIDTH OF ONE TREAD THAT IS REQUIRED AT EACH BOTTOM RISER.

FIGURE 19
STAIR HANDRAILS

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NOTE: The automatic door reopening device is activated if an object passes through either line A or B. Line A and line B represent the vertical locations of the door reopening device not requiring contact.

FIGURE 20
HOISTWAY AND ELEVATOR ENTRANCES

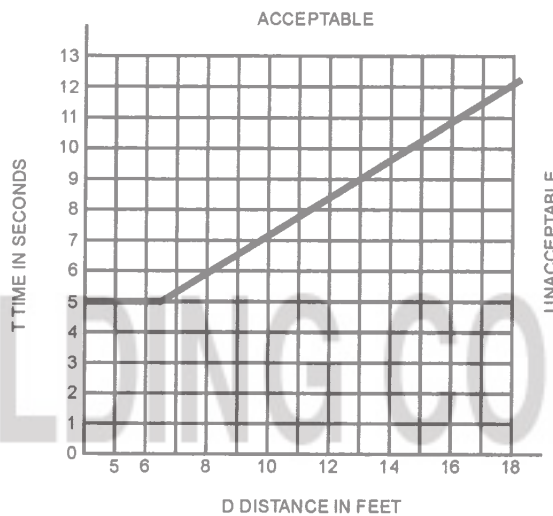
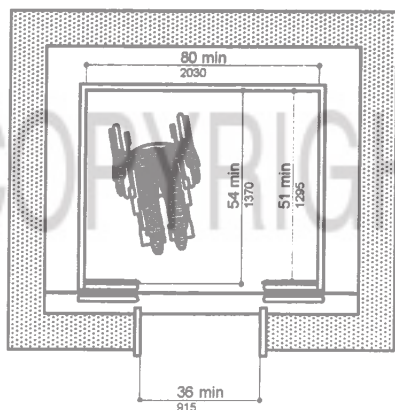
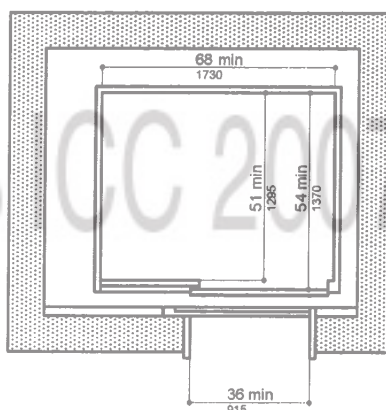


FIGURE 21
GRAPH OF TIMING EQUATION

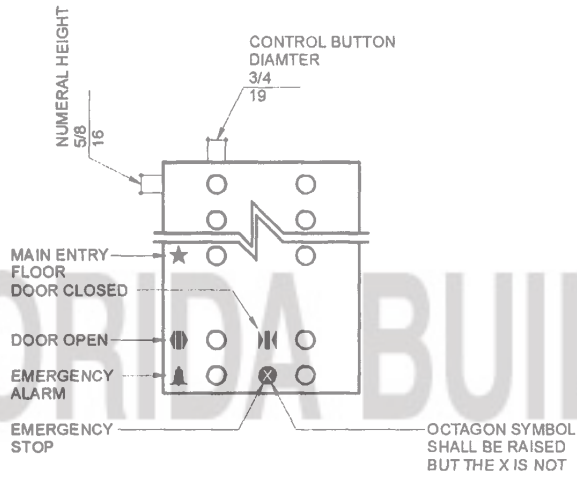


(a)

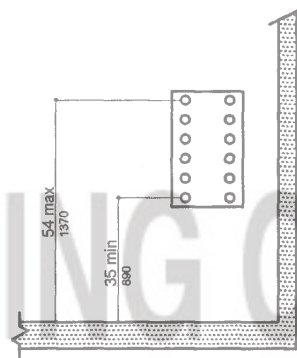


(b)

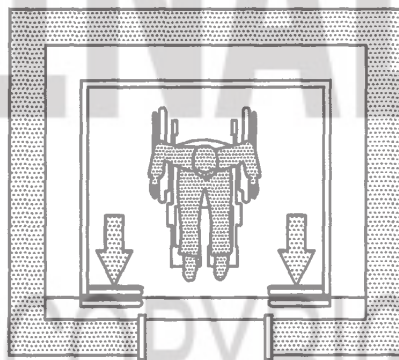
FIGURE 22
MINIMUM DIMENSIONS OF ELEVATOR CARS



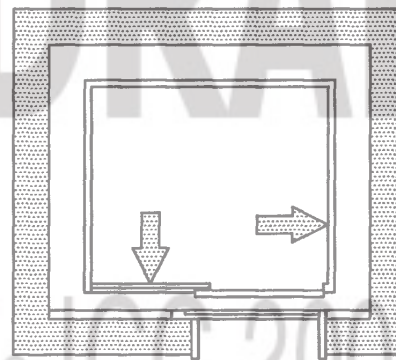
(a)
Panel Detail



(c)
Car Control Height



(b)
Alternate Locations
of Panel with
Center Opening Door



(d)
Alternate Locations
of Panel with Side Opening Door

**FIGURE 23
CAR CONTROLS**

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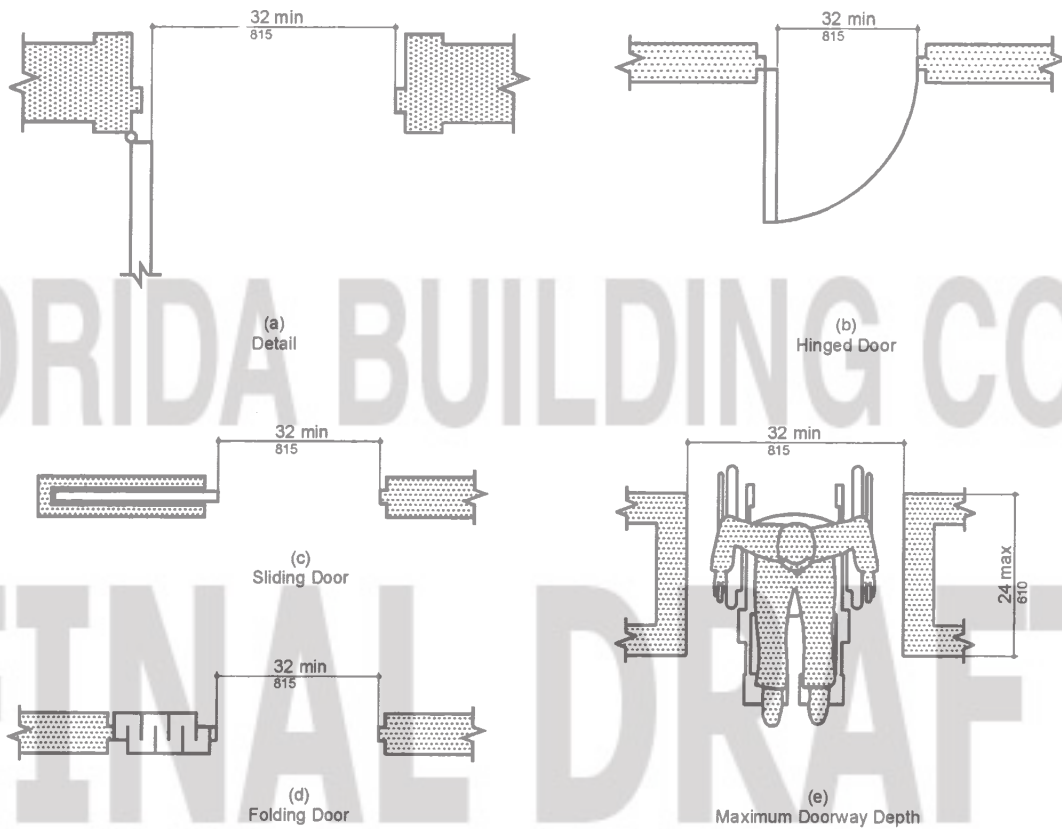
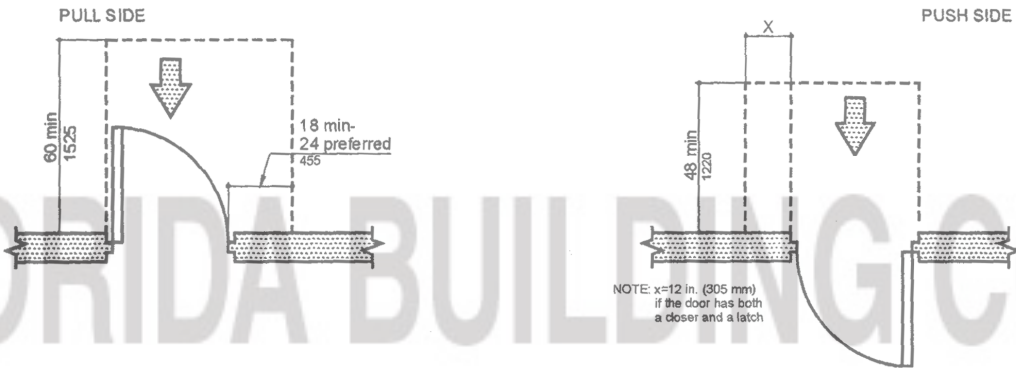


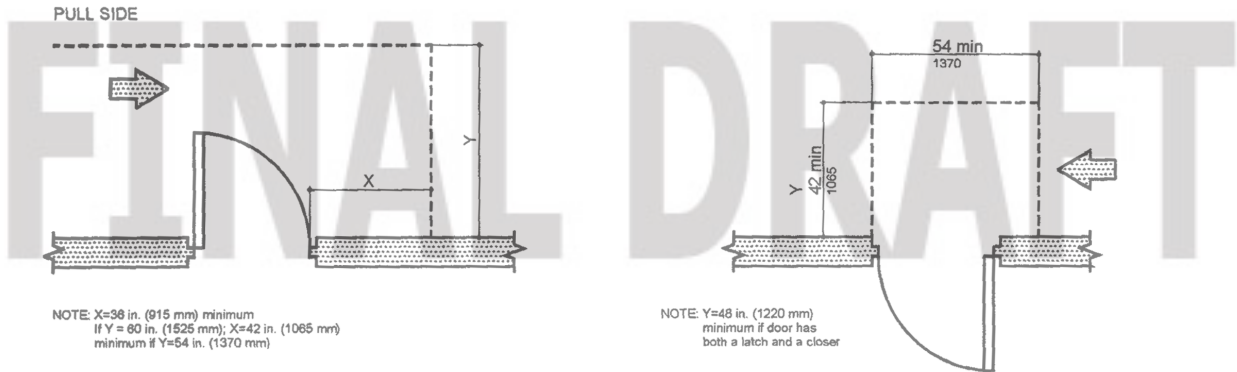
FIGURE 24
CLEAR DOORWAY WIDTH AND DEPTH

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(a)
Front Approaches - Swinging Doors



(b)
Hinge-side Approaches - Swinging Doors

NOTE: X=36 in. (915 mm) minimum
if Y = 60 in. (1525 mm); X=42 in. (1065 mm)
minimum if Y=54 in. (1370 mm)

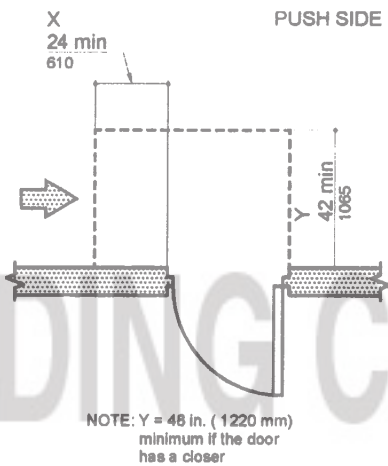
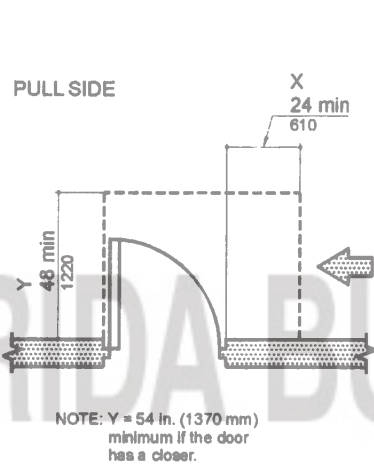
NOTE: Y=48 in. (1220 mm)
minimum if door has
both a latch and a closer

NOTE: All doors in alcoves shall comply with
the clearances for front approaches.

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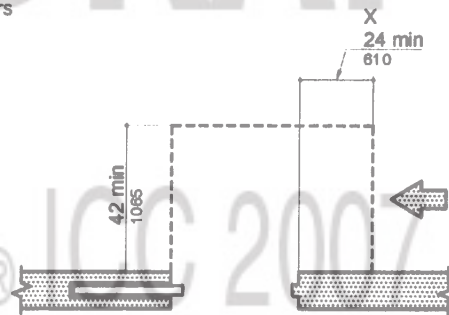
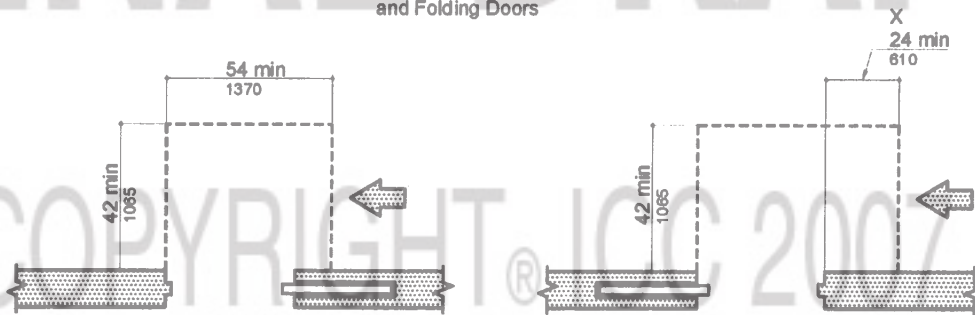
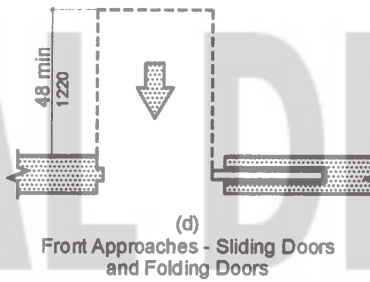
FIGURE 25
MANEUVERING CLEARANCE AT DOORS

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(c) Latch-side Approaches - Swinging Doors

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(e) Slide-side Approach - Sliding Doors and Folding Doors

(f) Latch-side Approach - Sliding Doors and Folding Doors

NOTE: All doors in alcoves shall comply with the clearances for front approaches.

FIGURE 25 (continued)
MANEUVERING CLEARANCE AT DOORS

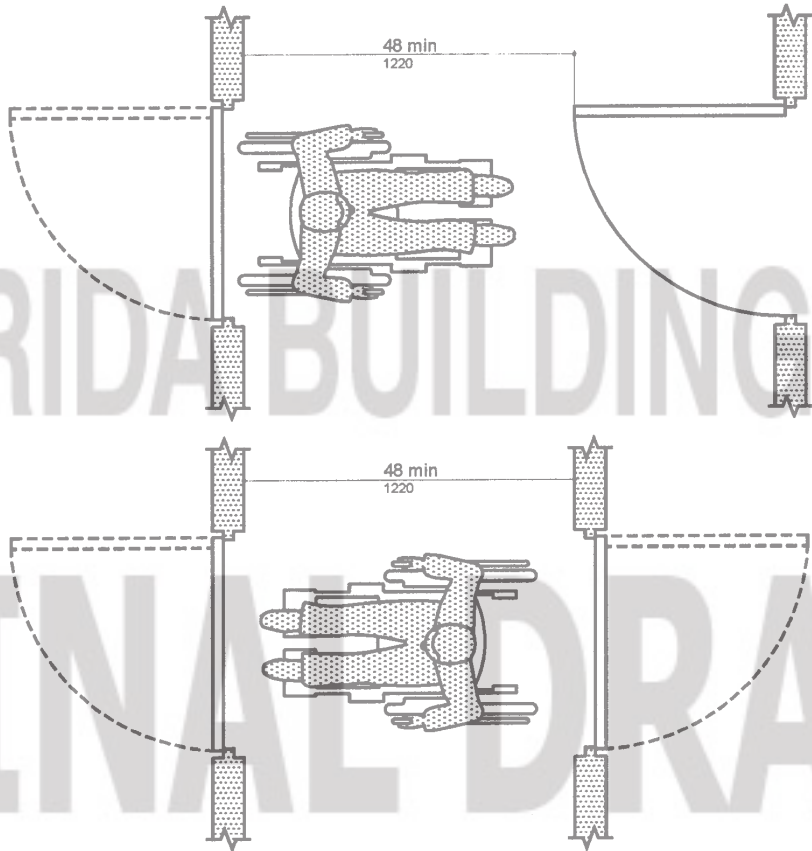
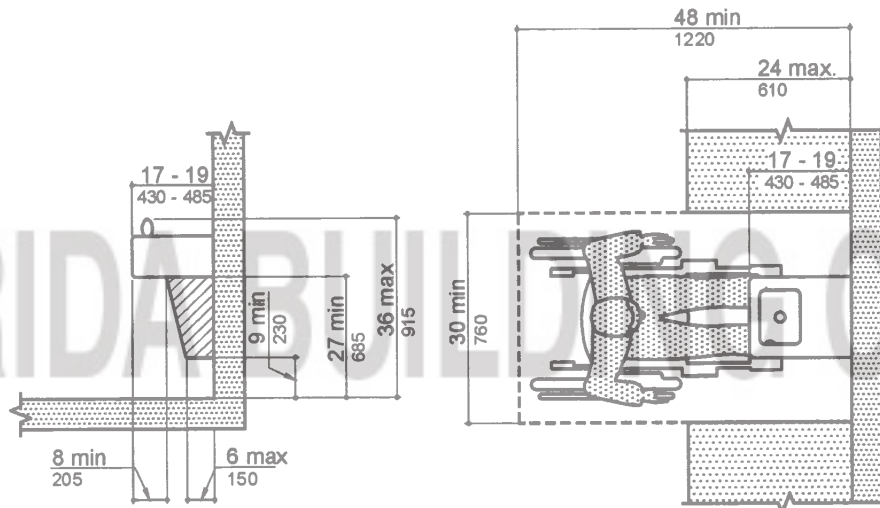


FIGURE 26
TWO HINGED DOORS IN SERIES

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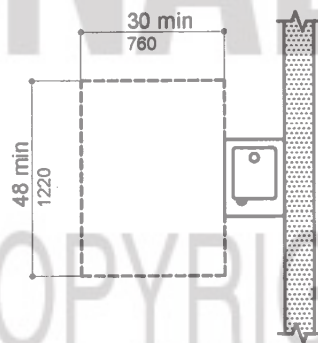
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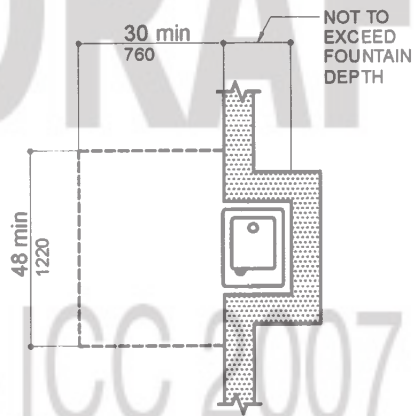
NOTE: Equipment permitted in shaded area

(a) Spout Height and Knee Clearance

(b) Clear Floor Space



(c) Free-Standing Fountain or Cooler



(d) Built-in Fountain or Cooler

FIGURE 27
DRINKING FOUNTAINS AND WATER COOLERS

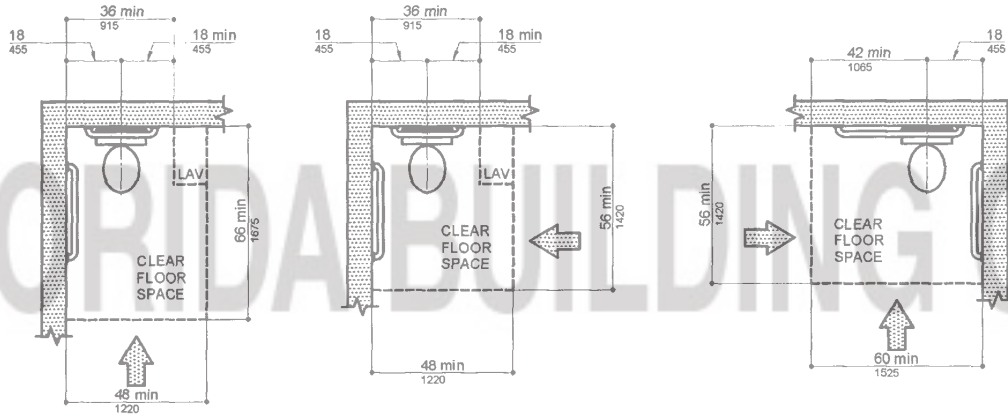


FIGURE 28
CLEAR FLOOR SPACE AT WATER CLOSETS (NOT IN STALL)

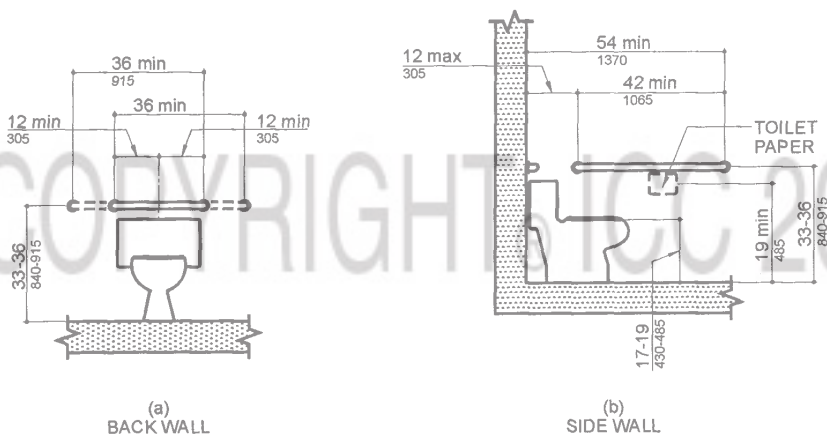
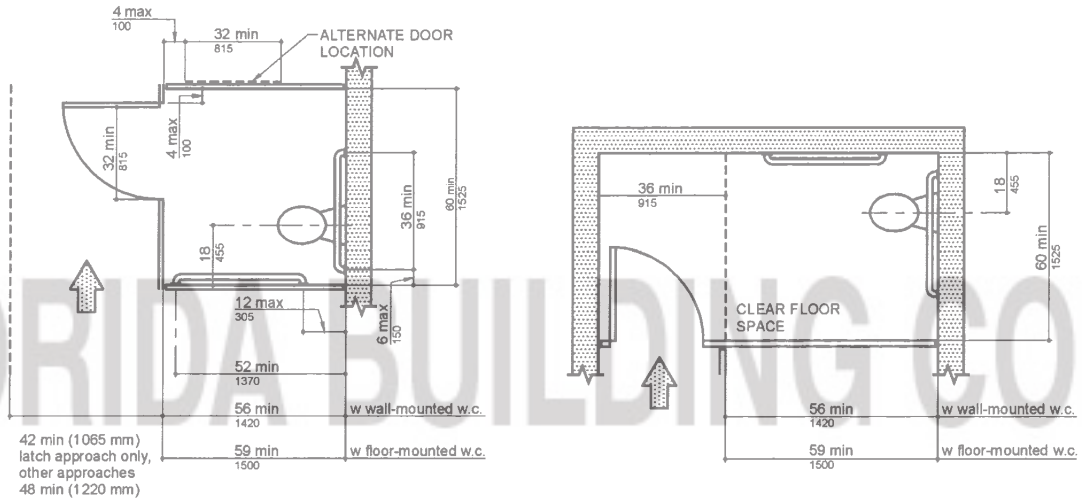
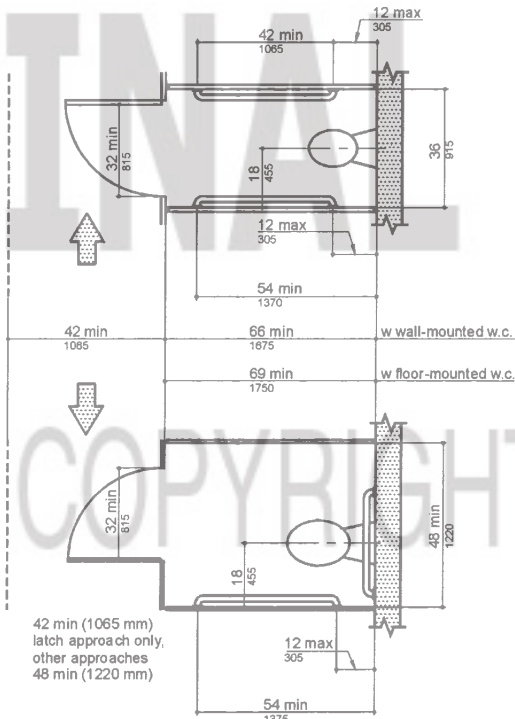


FIGURE 29
GRAB BARS AT WATER CLOSETS

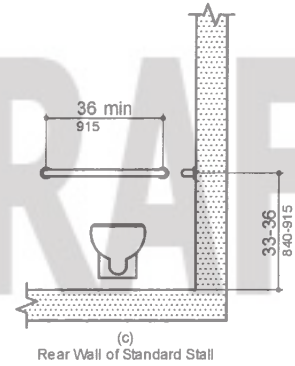
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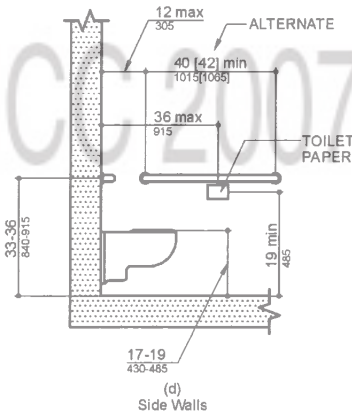
(a) Standard Stall



(b) Alternate Stalls



(c) Rear Wall of Standard Stall



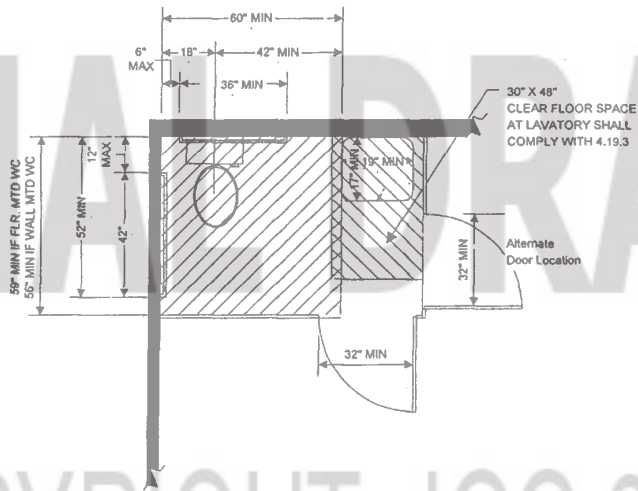
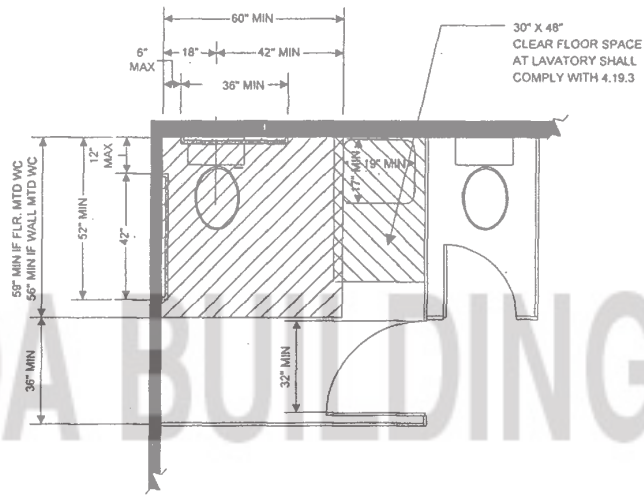
(d) Side Walls

FIGURE 30 TOILET STALLS

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IN NEW CONSTRUCTION, A LAVATORY SHALL BE PROVIDED WITHIN THE ACCESSIBLE TOILET STALL.
THE LAVATORY SHALL NOT ENCOACH INTO THE REQUIRED CLEAR FLOOR SPACE FOR THE WATER CLOSET.
SEE FIGURE 30 (a) FOR THE REQUIRED CLEAR FLOOR SPACE FOR THE WATER CLOSET.
THE LOCATION SHOWN FOR THE LAVATORY IS ONLY ONE OF MANY POSSIBLE LOCATIONS WITHIN THE ACCESSIBLE TOILET STALL.
THE WATER CLOSET SHALL BE LOCATED IN THE CORNER DIAGONAL TO THE DOOR.
THE TOILET STALL DOOR SHALL NOT SWING INTO THE REQUIRED CLEAR FLOOR SPACE FOR ANY FIXTURE.
FLUSH CONTROL SHALL COMPLY WITH SECTION 4.16.5.

FIGURE 30e
TOILET STALL NEW CONSTRUCTION

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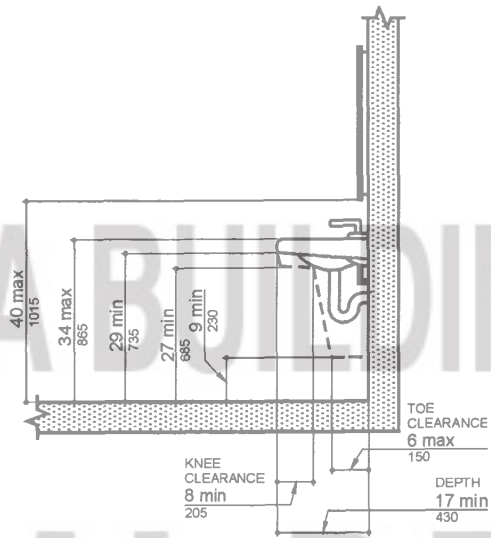


FIGURE 31
LAVATORY CLEARANCES

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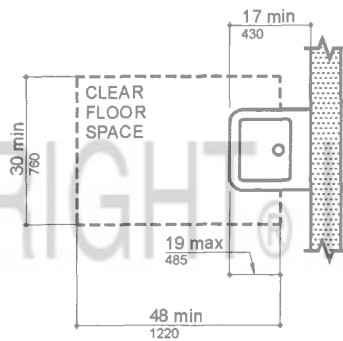
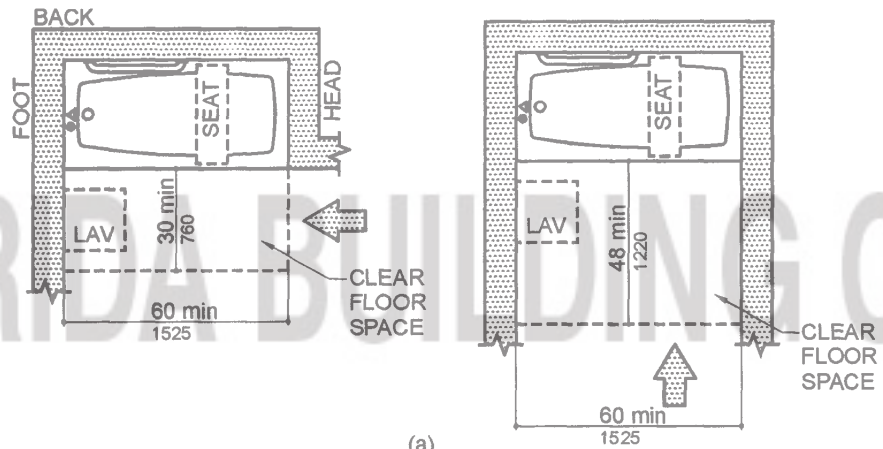


FIGURE 32
CLEAR FLOOR SPACE AT LAVATORIES

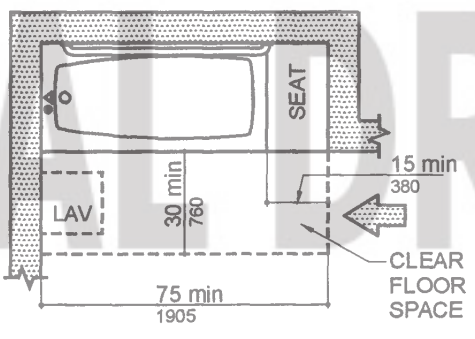
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(a)
With Seat in Tub

- SYMBOL KEYS:**
- = Shower controls
 - ◀ = Shower head
 - = Drain



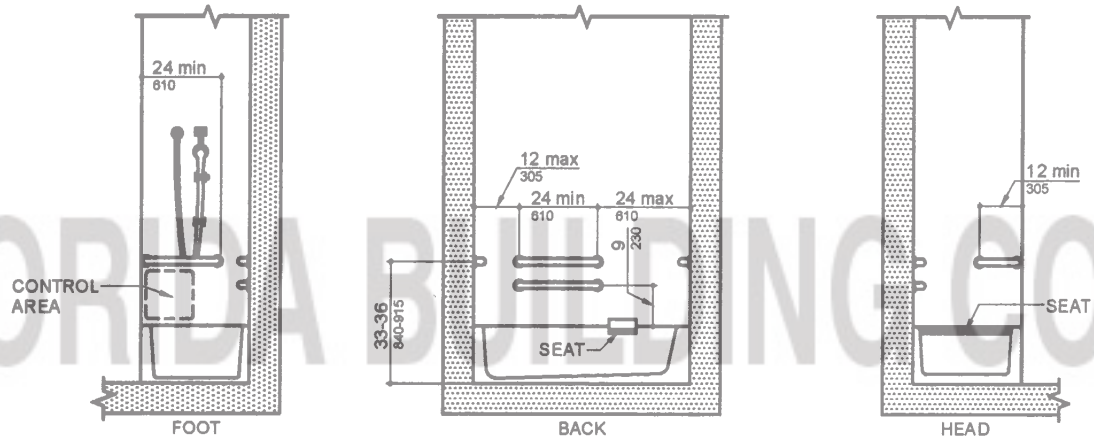
(b)
With Seat at Head of Tub

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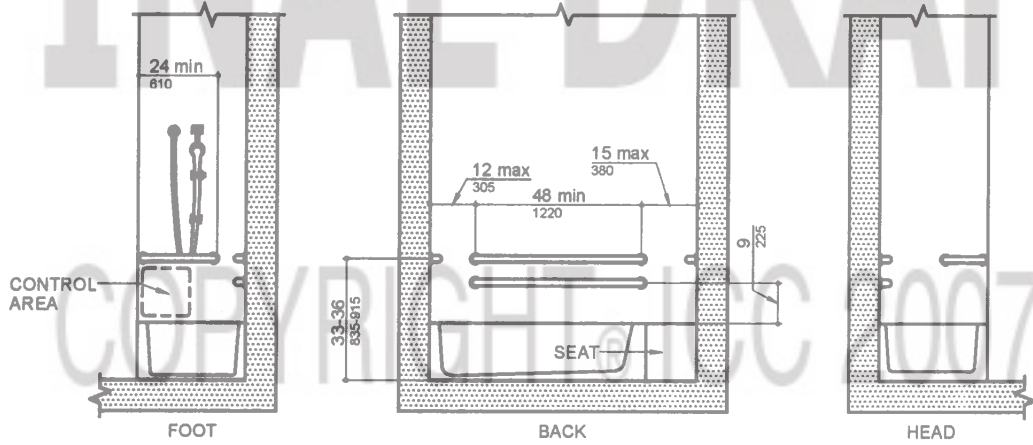
**FIGURE 33
CLEAR FLOOR SPACE AT BATHTUBS**

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(a)
With Seat in Tub



(b)
With Seat at Head of Tub

FIGURE 34
GRAB BARS AT BATHTUBS

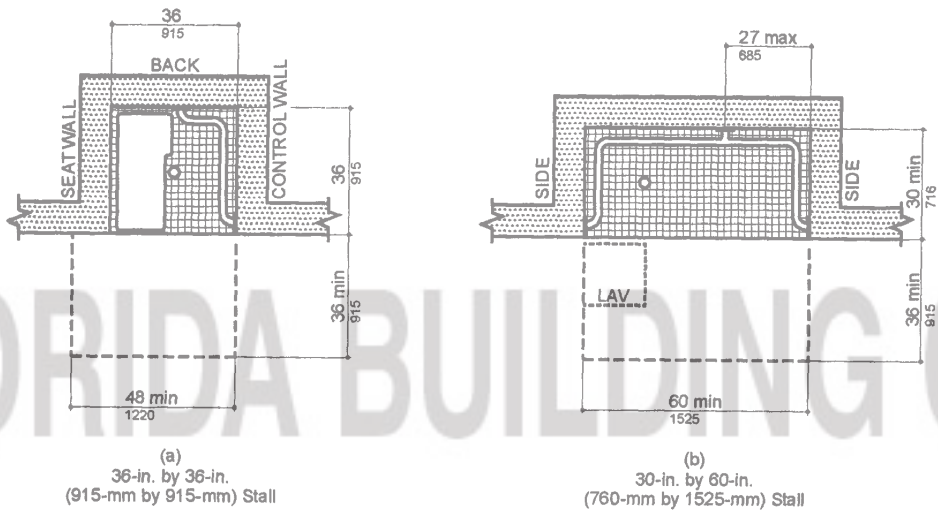


FIGURE 35
SHOWER SIZE AND CLEARANCES

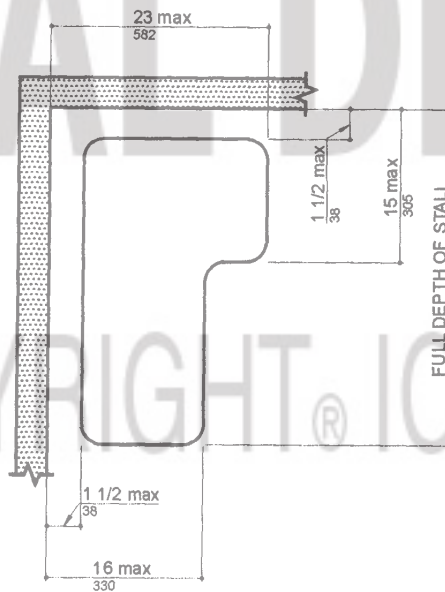
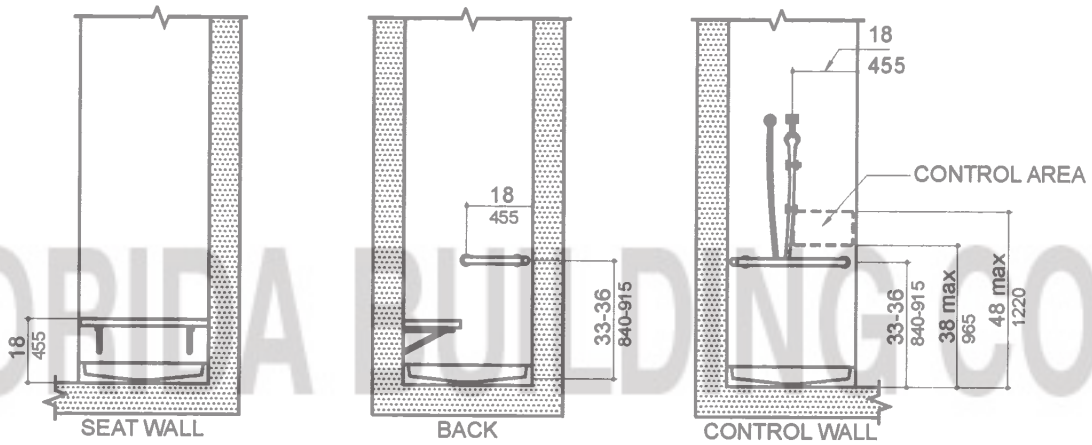
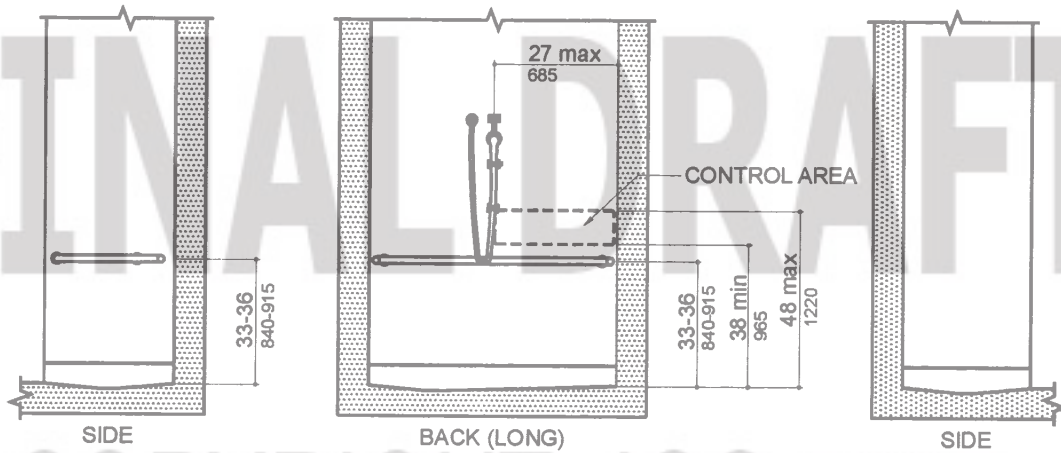


FIGURE 36
SHOWER SEAT DESIGN



(a)
36-in by 36-in (915-mm by 915-mm) Stall



(b)
30-in by 60-in (760-mm by 1525-mm) Stall

NOTE: Shower head and control area may be on back (long) wall (as shown) or on either side wall.

FIGURE 37
GRAB BARS AT SHOWER STALLS

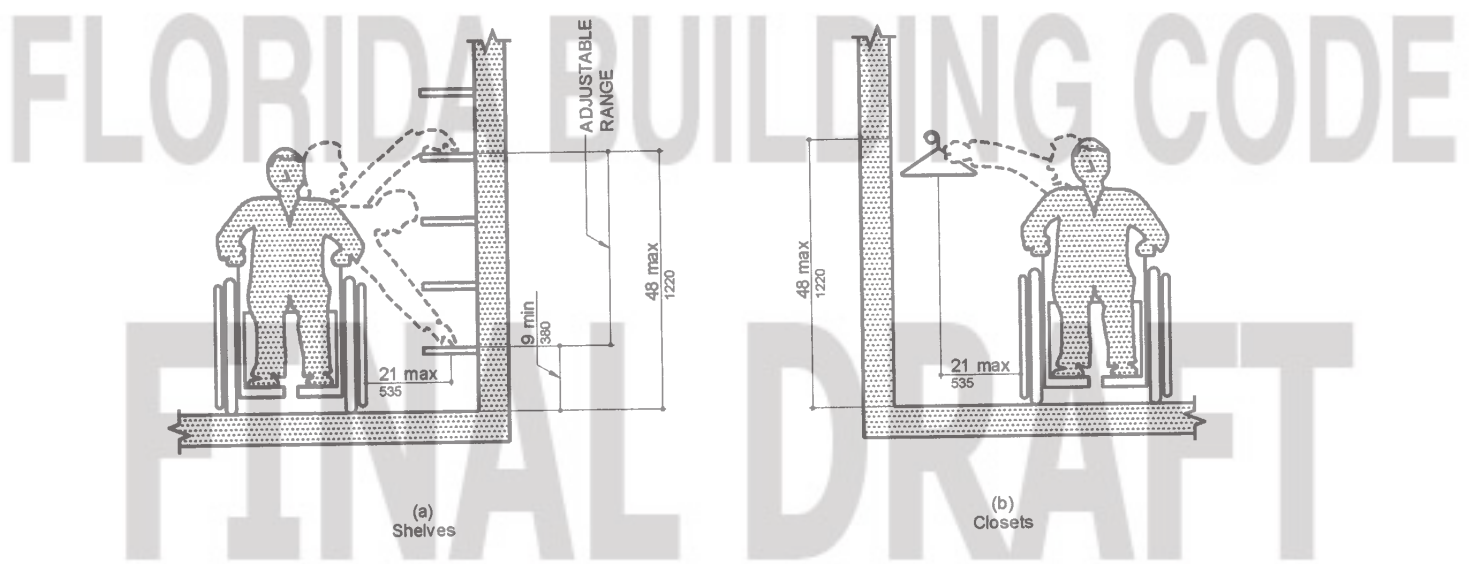
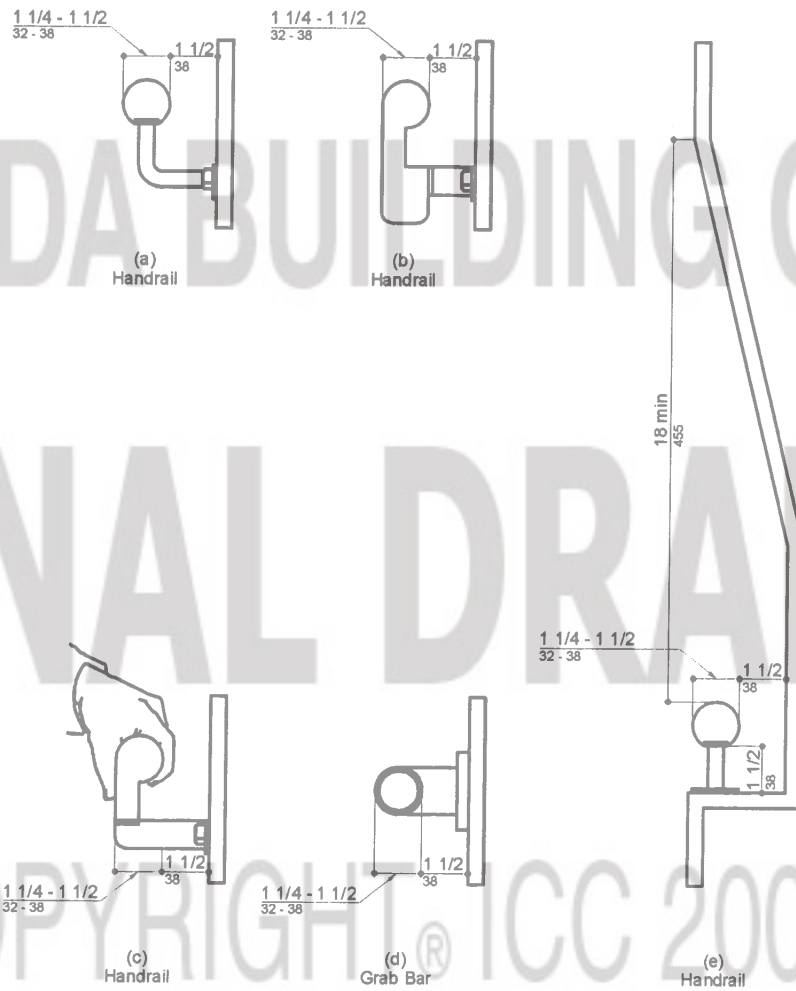


FIGURE 38
STORAGE SHELVES AND CLOSETS

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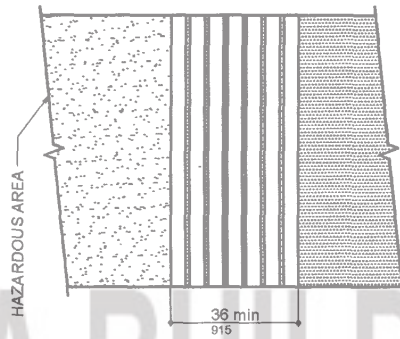
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FIGURE 39
SIZE AND SPACING OF HANDRAILS AND GRAB BARS

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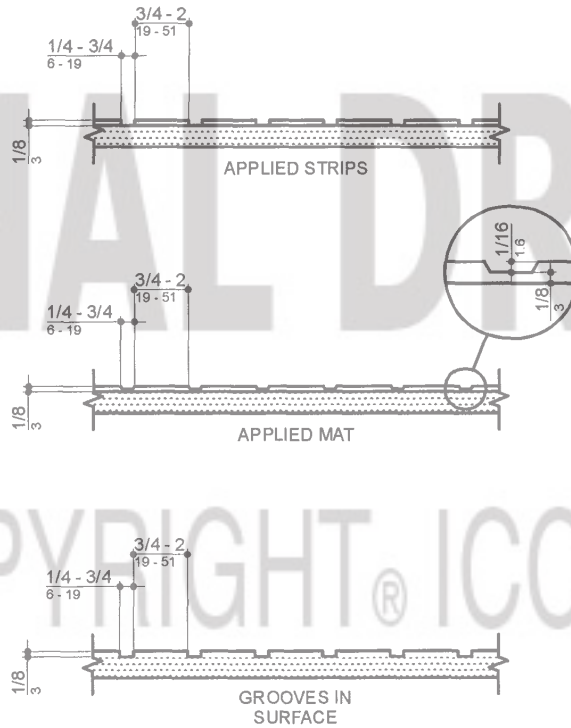


(a) Plan of Detectable Warning Surface

FIGURE 40 (A)

STRIPS AND GROOVES USED AS DETECTABLE WARNINGS ON WALKING SURFACES

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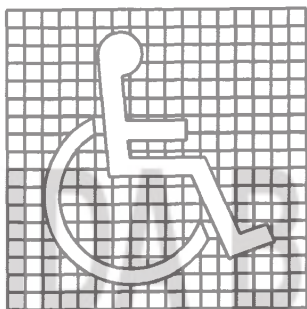
NOTE: Grooves may be used only indoors

(b) Sections of Detectable Warning Surfaces

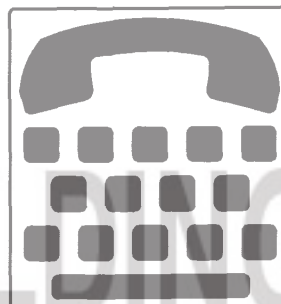
FIGURE 40 (B)

STRIPS AND GROOVES USED AS DETECTABLE WARNINGS ON WALKING SURFACES

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(a) Proportions
International Symbol
of Accessibility



(c)
International TDD Symbol



(b)
Display Conditions
International Symbol
of Accessibility

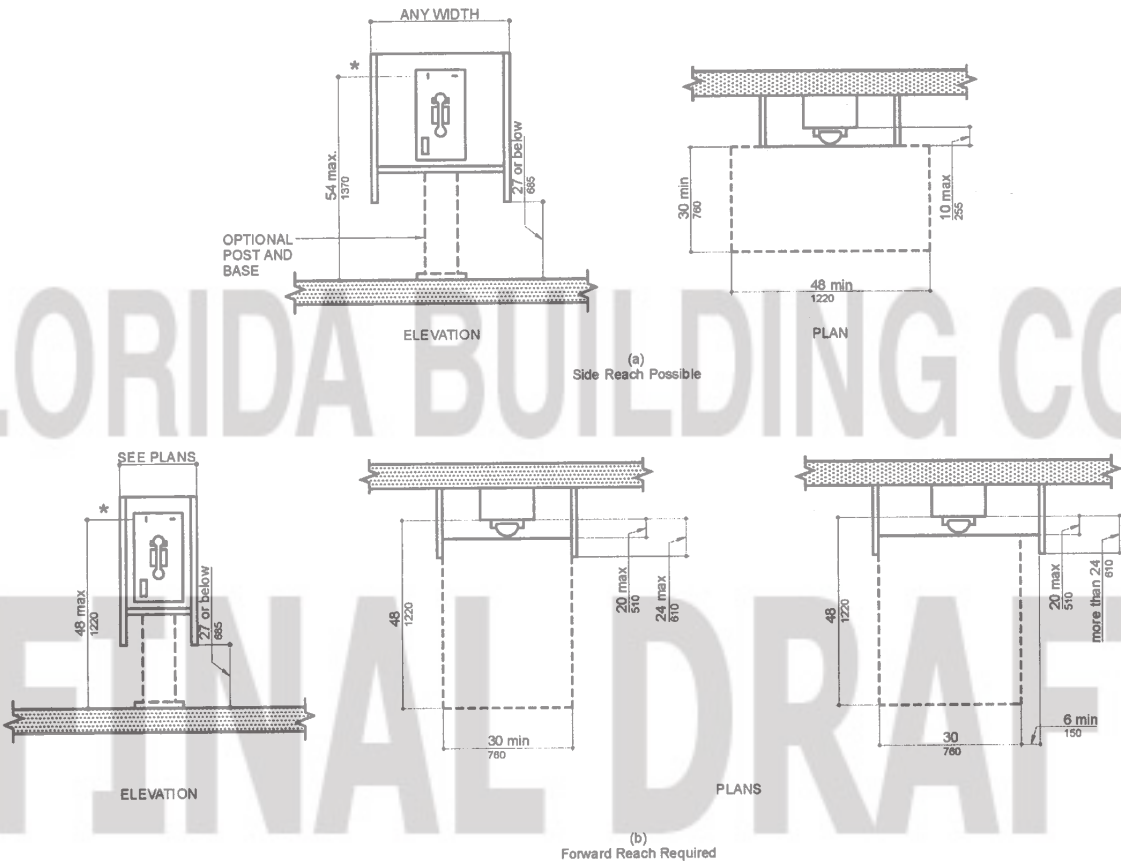


(d)
International Symbol of
Access for Hearing Loss

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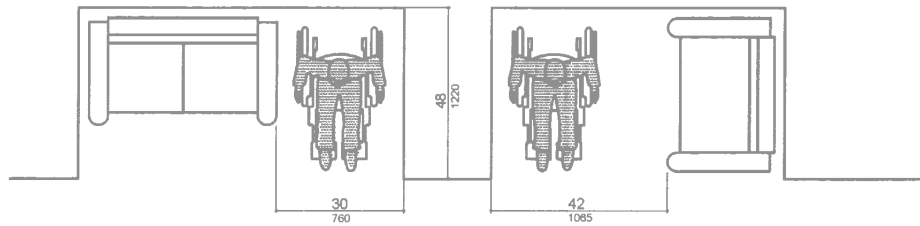
FIGURE 43
INTERNATIONAL SYMBOLS

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* HEIGHT TO HIGHEST OPERABLE PARTS WHICH ARE ESSENTIAL TO BASIC OPERATION OF TELEPHONE

FIGURE 44
MOUNTING HEIGHTS AND CLEARANCES FOR TELEPHONES



ACCESSIBLE PATH OF TRAVEL

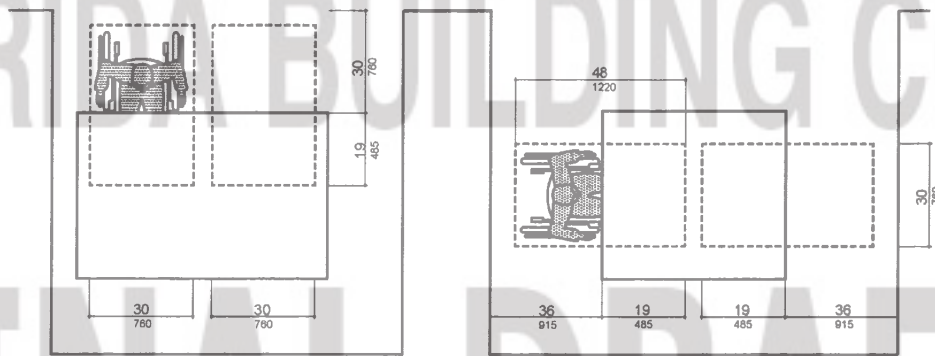
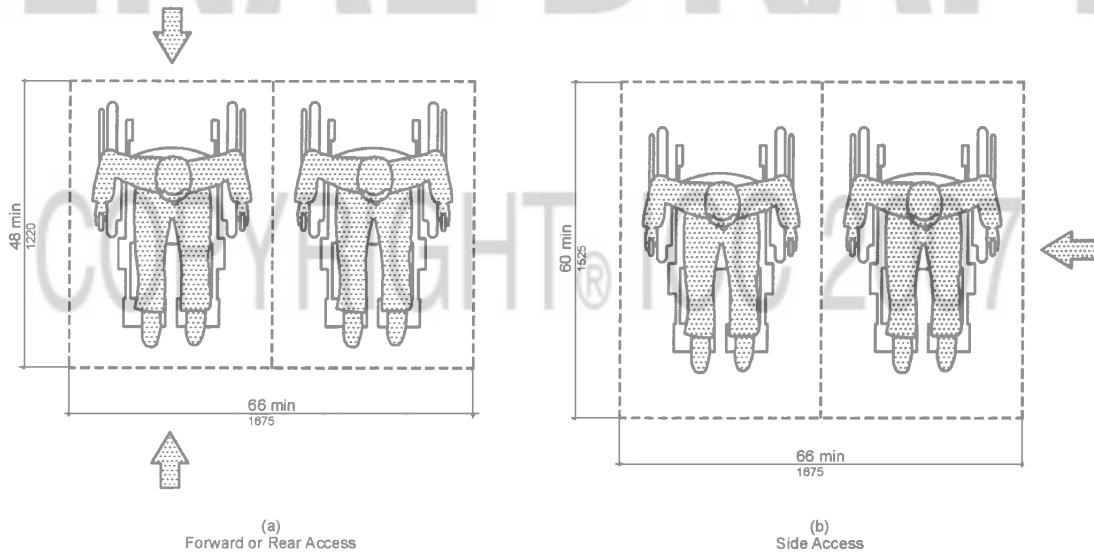


FIGURE 45
MINIMUM CLEARANCES FOR SEATING AND TABLES



(a)
Forward or Rear Access

(b)
Side Access

FIGURE 46
SPACE REQUIREMENTS FOR WHEELCHAIR SEATING SPACES IN SERIES

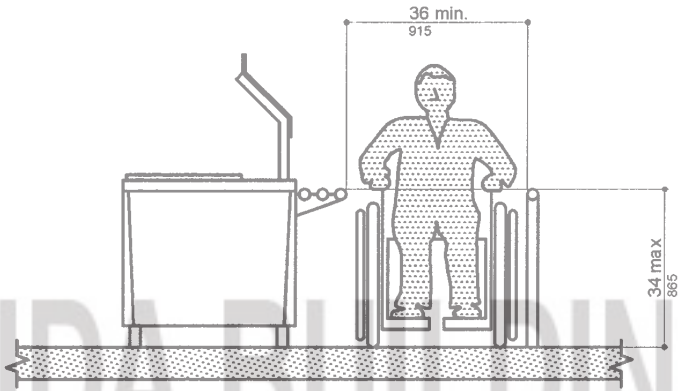


FIGURE 53
FOOD SERVICE LINES

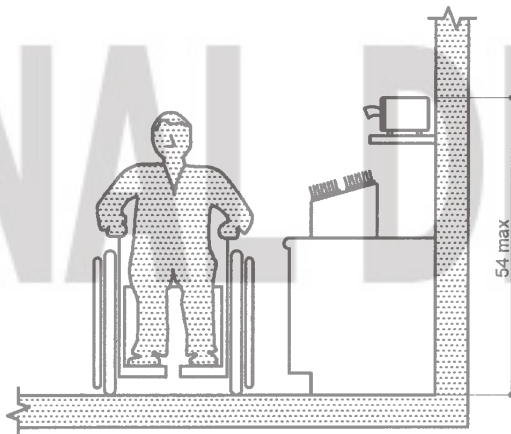


FIGURE 54
TABLEWARE AREAS

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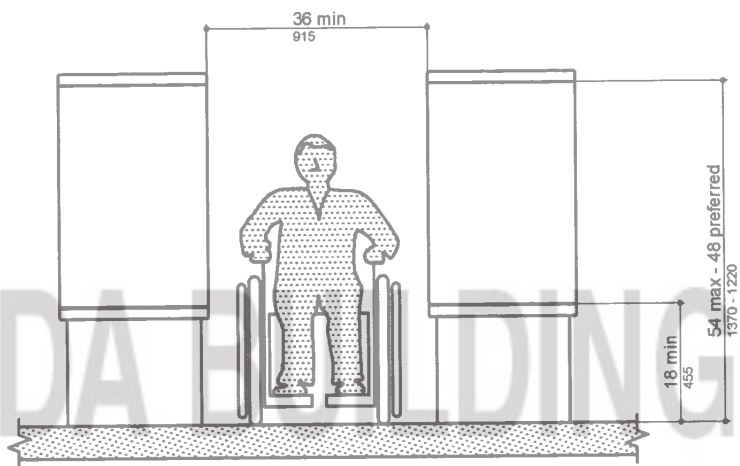


FIGURE 55
CARD CATALOG

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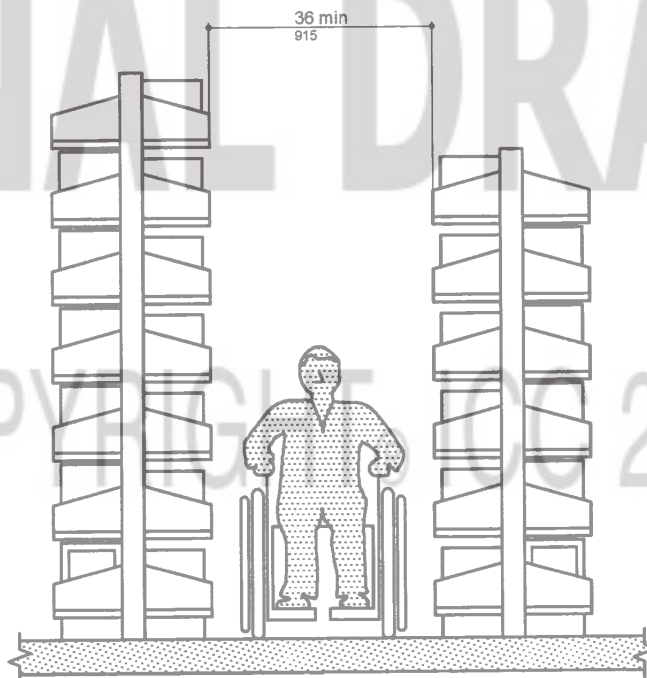


FIGURE 56
STACKS

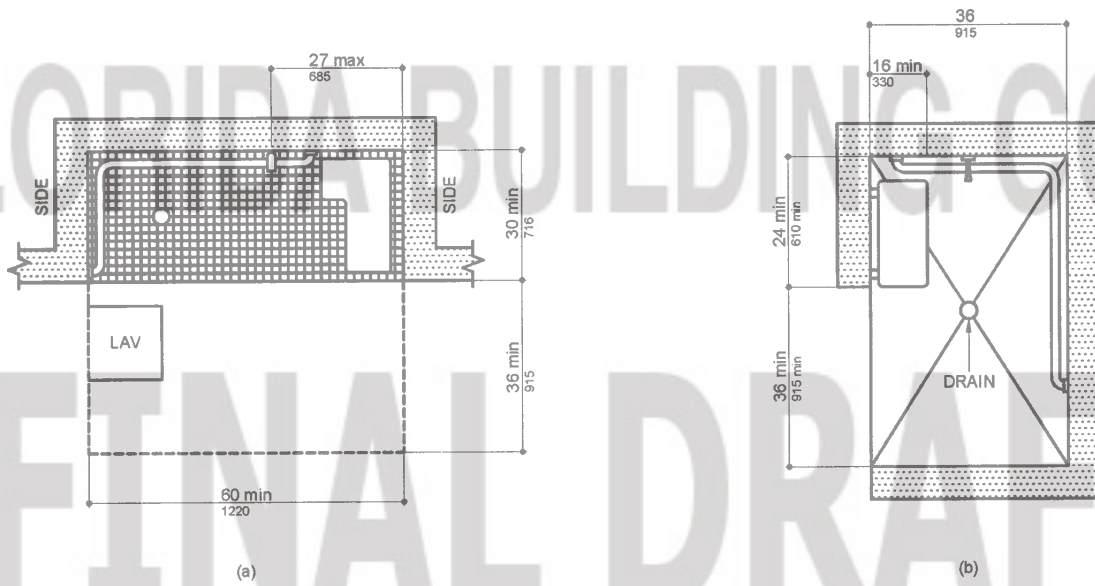


FIGURE 57
ROLL-IN SHOWER WITH FOLDING SEAT

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APPENDIX A
COMMENTARY - APPENDIX OF THE ADAAG
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FAIR HOUSING ACCESSIBILITY GUIDELINES
PART B

Design Guidelines for Accessible/Adaptable Dwellings

Issued by the Department of Housing and Urban Development

The *Fair Housing Act Design Manual* is published by the Department of Housing and Urban Development to assist designers and builders in meeting the accessibility requirements of the Fair Housing Act. Copies of this publication are available from the HUD Customer Service Center at 1-800-767-7468.

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NOTE: This is a reprint of the final Fair Housing Accessibility Guidelines published in the Federal Register on March 6, 1991, Vol. 56, No. 44, pages 9472-9515. This reprint incorporates corrections to the final guidelines, which were published in the Federal Register on June 24, 1991.

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3. Fair Housing Act Design and Construction Requirements
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5. Guidelines
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- Requirement 2. Accessible and usable public and common use areas.
- Requirement 3. Usable doors.
- Requirement 4. Accessible route into and through the covered dwelling unit
- Requirement 5. Light switches, electrical outlets, thermostats and other environmental controls in accessible locations.
- Requirement 6. Reinforced walls for grab bars.
- Requirement 7. Usable kitchens and bathrooms.

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FAIR HOUSING ACCESSIBILITY GUIDELINES

Section 1. Introduction

Authority

Section 804(f)(5)(C) of the Fair Housing Amendments Act of 1988 directs the Secretary of the Department of Housing and Urban Development to provide technical assistance to States, local governments, and other persons in implementing the accessibility requirements of the Fair Housing Act. These guidelines are issued under this statutory authority.

Purpose

The purpose of these guidelines is to provide technical guidance on designing dwelling units as required by the Fair Housing Amendments Act of 1988 (Fair Housing Act). These guidelines are not mandatory, nor do they prescribe specific requirements which must be met, and which, if not met, would constitute unlawful discrimination under the Fair Housing Act. Builders and developers may choose to depart from these guidelines and seek alternate ways to demonstrate that they have met the requirements of the Fair Housing Act. These guidelines are intended to provide a safe harbor for compliance with the accessibility requirements of the Fair Housing Act.

Scope

These guidelines apply only to the design and construction requirements of 24 CFR 100.205. Compliance with these guidelines do not relieve persons participating in a Federal or Federally-assisted program or activity from other requirements, such as those required by Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794) and the Architectural Barriers Act of 1968 (42 U.S.C. 4151-4157). Accessible design requirements for Section 504 are found at CFR Part 8. Accessible design requirements for the Architectural Barriers Act are found at 24 CFR Part 40.

Organization of Guidelines

The design guidelines are incorporated in Section 5 of this document. Each guideline cites the appropriate paragraph of HUD's regulation at 24 CFR 100-205; quotes from the regulation to identify the required design features, and states recommended specifications for each design feature.

Generally, these guidelines rely on the American National Standards Institute (ANSI) A117.1-1986, American National Standard for Buildings and Facilities-Providing Accessibility and Useability for Physically Handicapped People (ANSI Standard). Where the guidelines rely on sections of the ANSI Standard, the ANSI sections are cited. Only those sections of the ANSI Standard cited in the guidelines are recommended for compliance with 24 CFR 100.205. For those guidelines that differ from the ANSI Standard, recommended specifications are provided. The texts of cited ANSI sections are not reproduced in the guidelines. The complete text of the 1986 version of the ANSI A117.1 Standard may be purchased from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

Section 2. Definitions

As used in these Guidelines:

“Accessible”, when used with respect to the public and common use areas of a building containing covered multifamily dwellings, means that the public or common use areas of the building can be approached, entered, and used by individuals with physical handicaps. The phrase “readily accessible to and usable by” is synonymous with accessible. A public or common use area that complies with the appropriate requirements of ANSI A117.1-1986, a comparable standard or these guidelines is “accessible” within the meaning of this paragraph.

“Accessible route” means a continuous unobstructed path connecting accessible elements and spaces in a building or within a site that can be negotiated by a person with a severe disability using a wheelchair, and that is also safe for and usable by people with other disabilities. Interior accessible routes may include corridors, floors, ramps, elevators and lifts. Exterior accessible routes may include parking access aisles, curb ramps, walks, ramps and lifts. A route that complies with the appropriate requirements of ANSI A117.1-1986, a comparable standard, or SectionFHAG-5, Requirement 1 of these guidelines is an “accessible route”. In the circumstances described in

SectionFHAG-5, Requirements 1 and 2, “accessible route” may include access via a vehicular route.

“Adaptable dwelling units”, when used with respect to covered multifamily dwellings, means dwelling units that include the features of adaptable design specified in 24 CFR 100.205(c)(2)-(3).

“ANSIA117/1-1086” means the 1986 edition of the American National Standard for buildings and facilities providing accessibility and usability for physically handicapped people.

“Assistive device” means an aid, tool, or instrument used by a person with disabilities to assist in activities of daily living. Examples of assistive devices include tongs, knob-turners, and oven-rack pusher/pullers.

“Bathroom”, means a bathroom which includes a water closet (toilet), lavatory (sink), and bathtub or shower. It does not include single-fixture facilities or those with only a water closet and lavatory. It does include a compartmented bathroom. A compartmented bathroom is one in which the fixtures are distributed among interconnected rooms. A compartmented bathroom is considered a single unit and is subject to the Act's requirements for bathrooms.

“Building” means a structure, facility or portion thereof that contains or serves one or more dwelling units.

“Building entrance on an accessible route” means an accessible entrance to a building that is connected by an accessible route to public transportation stops, to parking or passenger loading zones, or to public streets or sidewalks, if available. A building entrance that complies with ANSI A117.1-1986 (see SectionFHAG-5, Requirement 1 of these guidelines) or a comparable standard complies with the requirements of this paragraph.

“Clear” means unobstructed.

“Common use areas” means rooms, spaces or elements inside or outside of a building that are made available for the use of residents of a building or the guests thereof. These areas include hallways, lounges, lobbies, laundry rooms, refuse rooms, mail rooms, recreational areas and passageways among and between buildings. See SectionFHAG-5, Requirement 2 of these guidelines.

“Controlled substance” means any drug or other substance, or immediate precursor included in the definition in Section 102 of the Controlled Substances Act (21 U.S.C. 802).

“Covered multifamily dwellings” or “covered multifamily dwellings subject to the Fair Housing Amendments” means buildings consisting of four or more dwelling units if such buildings have one or more elevators; and ground floor dwelling units in other buildings consisting of four or more dwelling units. Dwelling units within a single structure separated by firewalls do not constitute separate buildings.

“Dwelling unit” means a single unit of residence for a household of one or more persons. Examples of dwelling units covered by these guidelines include: condominiums; an apartment unit within an apartment building; and other types of dwellings in which sleeping accommodations are provided but toileting or cooking facilities are shared by occupants of more than one room or portion of the dwelling. Examples of the latter include dormitory rooms and sleeping accommodations in shelters intended for occupancy as a residence for homeless persons.

“Entrance” means any exterior access point to a building or portion of a building used by residents for the purpose of entering. For purposes of these guidelines, an “entrance” does not include a door to a loading dock or a door used primarily as a service entrance, even if nonhandicapped residents occasionally use that door to enter.

“Finished grade” means the ground surface of the site after all construction, levelling, grading, and development has been completed.

“Ground floor” means a floor of a building with a building entrance on an accessible route. A building may have one or more ground floors. Where the first floor containing dwelling units in a building is above grade, all units on

that floor must be served by a building entrance on an accessible route. This floor will be considered to be a ground floor.

“Handicap” means, with respect to a person, a physical or mental impairment which substantially limits one or more major life activities; a record of such an impairment; or being regarded as having such an impairment. This term does not include current, illegal use of or addiction to a controlled substance. For purposes of these guidelines, an individual shall not be considered to have a handicap solely because that individual is a transvestite.

As used in this definition:

(a) “Physical or mental impairment” includes:

(1) Any physiological disorder or condition, cosmetic disfigurement, or anatomical loss affecting one or more of the following body systems: Neurological; musculoskeletal; special sense organs; respiratory, including speech organs; cardiovascular; reproductive; digestive; genito-urinary; hemic and lymphatic; skin; and endocrine; or

(2) Any mental or psychological disorder, such as mental retardation, organic brain syndrome, emotional or mental illness, and specific learning disabilities. The term “physical or mental impairment” includes, but is not limited to, such diseases and conditions as orthopedic, visual, speech and hearing impairments, cerebral palsy, autism, epilepsy, muscular dystrophy, multiple sclerosis, cancer, heart disease, diabetes, Human Immunodeficiency Virus infection, mental retardation, emotional illness, drug addiction (other than addiction caused by current, illegal use of a controlled substance) and alcoholism. These guidelines are designed to make units accessible or adaptable for people with physical handicaps.

(b) “Major life activities” means functions such as caring for one’s self, performing manual tasks, walking, seeing, hearing, speaking, breathing, learning and working.

(c) “Has a record of such an impairment” means has a history of, or has been misclassified as having, a mental or physical impairment that substantially limits one or more major life activities.

(d) “Is regarded as having an impairment” means:

(1) Has a physical or mental impairment that does not substantially limit one or more major life activities but that is treated by another person as constituting such a limitation;

(2) Has a physical or mental impairment that substantially limits one or more major life activities only as a result of the attitudes of others toward such impairment; or

(3) Has none of the impairments defined in paragraph (a) of this definition but is treated by another person as having such an impairment.

“Loft” means an intermediate level between the floor and ceiling of any story, located within a room or rooms of a dwelling.

“Multistory dwelling unit” means a dwelling unit with finished living space located on one floor and the floor or floors immediately above or below it.

“Public use areas” means interior or exterior rooms or spaces of a building that are made available to the general public. Public use may be provided at a building that is privately or publicly owned.

“Single-story dwelling unit” means a dwelling unit with all finished living space located on one floor.

“Site” means a parcel of land bounded by a property line or a designated portion of a public right of way.

“Slope” means the relative steepness of the land between two points and is calculated as follows: The distance and elevation between the two points (e.g., an entrance and a passenger loading zone) are determined from a topographical map. The difference in elevation is divided by the distance and that fraction is multiplied by 100 to obtain a percentage slope figure. For example, if a principal entrance is ten feet from a passenger loading zone, and the principal entrance is raised one foot higher than the passenger loading zone, then the slope is $1/10 \times 100 = 10\%$.

“Story” means that portion of a dwelling unit between the upper surface of any floor and the upper surface of the floor next above, or the roof of the unit. Within the context of dwelling units, the terms “story” and “floor” are synonymous.

“Undisturbed site” means the site before any construction, levelling, grading, or development associated with the current project.

“Vehicular or pedestrian arrival points” means public or resident parking areas, public transportation stops, passenger loading zones, and public streets or sidewalks.

“Vehicular route” means a route intended for vehicular traffic, such as a street, driveway or parking lot.

Section 3. Fair Housing Act Design and Construction Requirements

The regulations issued by the Department at 24 CFR 100/205 state:

Section 100.205 Design and construction requirements.

(a) Covered multifamily dwellings for first occupancy after March 13, 1991, shall be designed and constructed to have at least one building entrance on an accessible route unless it is impractical to do so because of the site. For purposes of this section, a covered multifamily dwelling shall be deemed to be designed and constructed for first occupancy on or before March 13, 1991, if they are occupied by that date or if the last building permit or renewal thereof for the covered multifamily dwellings is issued by a State, County or local government on or before January 13, 1990. The burden of establishing impracticality because of terrain or unusual site characteristics is on the person or persons who designed or constructed the housing facility.

(b) The application of paragraph (a) of this section may be illustrated by the following examples:

Example (1): A real estate developer plans to construct six covered multifamily dwelling units on a site with a hilly terrain. Because of the terrain it will be necessary to climb a long and steep stairway in order to enter the dwellings. Since there is no practical way to provide an accessible route to any of the dwellings, one need not be provided.

Example (2): A real estate developer plans to construct a building consisting of 10 units of multifamily housing on a waterfront site that floods frequently. Because of this unusual characteristic of the site, the builder plans to construct the building on stilts. It is customary for housing in the geographic area where the site is located to be built on stilts. The housing may lawfully be constructed on the proposed site on stilts even though this means that there will be no practical way to provide an accessible route to the building entrance.

Example (3): A real estate developer plans to construct a multifamily housing facility on a particular site. The developer would like the facility to be built on the site to contain as many units as possible. Because of the configuration and terrain of the site, it is possible to construct a building with 105 units on the site provided the site does not have an accessible route leading to the building entrance. It is also possible to construct a building on the site with an accessible route leading to the building entrance. However, such a building would have no more than 100 dwelling units. The building to be constructed on the site must have a building entrance on an accessible route because it is not impractical to provide such an entrance because of the terrain or unusual characteristics of the site.

(c) All covered multifamily dwellings for first occupancy after March 13, 1991, with a building entrance on an accessible route shall be designed and constructed in such a manner that—

M(1) The public and common use areas are readily accessible to and usable by handicapped persons;

(2) All the doors designed to allow passage into and within all premises are sufficiently wide to allow passage by handicapped persons in wheelchairs; and

(3) All premises within covered multifamily dwelling units contain the following features of adaptable design:

(i) An accessible route into and through the covered dwelling unit;

(ii) Light switches, electrical outlets, thermostats, and other environmental controls in accessible locations;

(iii) Reinforcements in bathroom walls to allow later installation of grab bars around the toilet, tub, shower, stall and shower seal, where such facilities are provided; and

(iv) Usable kitchen and bathrooms such that an individual in a wheelchair can maneuver about the space.

(d) The application of Paragraph (c) of this section may be illustrated by the following examples:

Example (1): A developer plans to construct a 100 unit condominium apartment building with one elevator. In accordance with Paragraph (a), the building has at least one accessible route leading to an accessible entrance. All 100 units are covered multifamily dwelling units and they all must be designed and constructed so that they comply with the accessibility requirements of Paragraph (c) of this section.

Example (3): A developer plans to construct 30 garden apartments in a three story building. The building will not have an elevator. The building does not have an elevator only the “ground floor” units are covered multifamily units. The “ground floor” is the first floor because that is the floor that has an accessible entrance. All of the dwelling units on the first floor must meet the accessibility requirements of Paragraph (c) of this section and must have access to at least one of each type of public or common use area available for residents in the building.

(e) Compliance with the appropriate requirements of ANSI A117.1-1986 suffices to satisfy the requirements of Paragraph (c)(3) of this section.

(f) Compliance with a duly enacted law of a State or unit of general local government that includes the requirements of Paragraphs (a) and (c) of this section satisfies the requirements of Paragraphs (a) and (c) of this section.

(g)(1) It is the policy of HUD to encourage States and units of general local government to include, in their existing procedures for the review and approval of newly constructed covered multifamily dwellings, determinations as to whether the design and construction of such dwellings are consistent with Paragraphs (a) and (c) of this section.

(2) A State or unit of general local government may review and approve newly constructed multifamily dwellings for the purpose of making determinations as to whether the requirements of Paragraphs (a) and (c) of this section are met.

(h) Determinations of compliance or noncompliance by a State or a unit of general local government under Paragraph (f) or (g) of this section are not conclusive in enforcement proceedings under the Fair Housing Amendments Act.

(i) This subpart does not invalidate or limit any law of a State or political subdivision of a State that requires dwellings to be designed and constructed in a manner that affords handicapped persons greater access than is required by this subpart.

Section 4. Application of the Guidelines

The design specifications (guidelines) presented in SectionFHAG-5 apply to new construction of “covered multifamily dwellings”, as defined in SectionFHAG-2. These guidelines are recommended for designing dwellings that comply with the requirements of the Fair Housing Amendments Act of 1988.

Section 5. Guidelines

Requirement 1. Accessible building entrance on an accessible route.

Under Section 100.205(a), covered multifamily dwellings shall be designed and constructed to have at least one building entrance on an accessible route, unless it is impractical to do so because of terrain or unusual characteristics of the site.

Guideline

(1) Building entrance. Each building on a site shall have at least one building entrance on an accessible route unless prohibited by the terrain, as provided in Paragraphs (2)(a)(i) or (2)(a)(ii), or unusual characteristics of the site, as provided in Paragraph (2)(b). This guideline applies both to a single building on a site and to multiple buildings on a site.

(a) Separate ground floor unit entrances. When a ground floor unit of a building has a separate entrance, each such ground floor unit shall be

served by an accessible route, except for any unit where the terrain or unusual characteristics of the site prohibit the provision of an accessible route to the entrance of that unit.

(b) Multiple entrances. Only one entrance is required to be accessible to any one ground floor of a building, except in cases where an individual dwelling unit has a separate exterior entrance, or where the building contains clusters of dwelling units, with each cluster sharing a different exterior entrance. In these cases, more than one entrance may be required to be accessible, as determined by analysis of the site. In every case, the accessible entrance should be on an accessible route to the covered dwelling units it serves.

(2) Site impracticality. Covered multifamily dwellings with elevators shall be designed and constructed to provide at least one accessible entrance on an accessible route, regardless of terrain or unusual characteristics of the site. Covered multifamily dwellings without elevators shall be designed and constructed to provide at least one accessible entrance on an accessible route unless terrain or unusual characteristics of the site are such that the following conditions are found to exist:

(a) Site impracticality due to terrain. There are two alternative tests for determining site impracticality due to terrain: the individual building test provided in paragraph (i), or the site analysis test provided in paragraph (ii). These tests may be used as follows.

A site with a single building having a common entrance for all units may be analyzed only as described in paragraph (i).

All other sites, including a site with a single building having multiple entrances serving either individual dwelling units or clusters of dwelling units, may be analyzed using the methodology in either Paragraph (i) or Paragraph (ii). For these sites for which either test is applicable, regardless of which test is selected, at least 20% of the total ground floor units in nonelevator buildings, on any site, must comply with the guidelines.

(i) Individual building test. It is impractical to provide an accessible entrance served by an accessible route when the terrain of the site is such that:

(A) The slopes of the undisturbed site measured between the planned entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance exceed 10 percent; and

(B) the slopes of the planned finished grade measured between the entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance also exceed 10 percent.

If there are no vehicular or pedestrian arrival points within 50 feet of the planned entrance, the slope for the purposes of this Paragraph (i) will be measured to the closest vehicular or pedestrian arrival point.

For purposes of these guidelines, vehicular or pedestrian arrival points include public or resident parking areas; public transportation stops; passenger loading zones; and public streets or sidewalks. To determine site impracticality, the slope would be measured at ground level from the point of the planned entrance on a straight line to (i) each vehicular or pedestrian arrival point that is within 50 feet of the planned entrance, or (ii) if there are no vehicular or pedestrian arrival points within that specified area, the vehicular or pedestrian arrival point closest to the planned entrance. In the case of sidewalks, the closest point to the entrance will be where a public sidewalk entering the site intersects with the sidewalk to the entrance. In the case of resident parking areas, the closest point to the planned entrance will be measured from the entry point to the parking area that is located closest to the planned entrance.

(ii) Site analysis test. Alternatively, for a site having multiple buildings, or a site with a single building with multiple entrances, impracticality of providing an accessible entrance served by an accessible route can be established by the following steps:

(A) The percentage of the total buildable area of the undisturbed site with a natural grade less than 10% slope shall be calculated. The analysis of the existing slope (before grading) shall be done on a topographic survey with two foot (2') contour intervals with slope determination made between each successive interval. The accuracy of the slope analysis shall be certified by a professional licensed engineer, landscape architect, architect or surveyor.

(B) To determine the practicality of providing accessibility to planned multifamily dwellings based on the topography of the existing natural terrain, the minimum percentage of ground floor units

to be made accessible should equal the percentage of the total buildable area (not including floodplains, wetlands, or other restricted use areas) of the undisturbed site that has an existing natural grade of less than 10% slope.

(C) In addition to the percentage established in paragraph (B), all ground floor units in a building, or ground floor units served by a particular entrance, shall be made accessible if the entrance to the units is on an accessible route, defined as a walkway with a slope between the planned entrance and a pedestrian or vehicular arrival point that is no greater than 8.33%.

(b) Site impracticality due to unusual characteristics. Unusual characteristics include sites located in a federally-designated floodplain or coastal high-hazard area and sites subject to other similar requirements of law or code that the lowest floor or the lowest structural member of the lowest floor must be raised to a specified level at or above the base flood elevation. An accessible route to a building entrance is impractical due to unusual characteristics of the site when:

(i) the unusual site characteristics result in a difference in finished grade elevation exceeding 30 inches and 10 percent measured between an entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance; or

(ii) if there are no vehicular or pedestrian arrival points within 50 feet of the planned entrance, the unusual characteristics result in a difference in finished grade elevation exceeding 30 inches and 10 percent measured between an entrance and the closest vehicular or pedestrian arrival point.

(3) Exceptions to site impracticality. Regardless of site considerations described in paragraphs (1) and (2), an accessible entrance on an accessible route is practical when:

(a) There is an elevator connecting the parking area with the dwelling units on a ground floor. (In this case, those dwelling units on the ground floor served by an elevator, and at least one of each type of public and common use areas, would be subject to these guidelines.) However:

(i) Where a building elevator is provided only as a means of creating an accessible route to dwelling units on a ground floor, the building is not considered an elevator building for purposes of these guidelines; hence, only the ground floor dwelling units would be covered.

(ii) If the building elevator is provided as a means of access to dwelling units other than dwelling units on a ground floor, then the building is an elevator building which is a covered multifamily dwelling, and the elevator in that building must provide accessibility to all dwelling units in the building, regardless of the slope of the natural terrain; or

(b) An elevated walkway is planned between a building entrance and a vehicular or pedestrian arrival point and the planned walkway has a slope no greater than 10 percent.

(4) Accessible entrance. An entrance that complies with ANSI 4.14 meets Section 100.205(a).

(5) Accessible route. An accessible route that complies with ANSI 4.3 would meet Section 100.205(a). If the slope of the finished grade between covered multifamily dwellings and a public or common use facility (including parking) exceeds 8.33%, or where other physical barriers (natural or manmade) or legal restrictions, all of which are outside the control of the owner, prevent the installation of an accessible pedestrian route, an acceptable alternative is to provide access via a vehicular route, so long as necessary site provisions such as parking spaces and curb ramps are provided at the public or common use facility.

Requirement 2. Accessible and usable public and common use areas.

Section 100.205(c)(1) provides that covered multifamily dwellings with a building entrance on an accessible route shall be designed in such a manner that the public and common use areas are readily accessible to and usable by handicapped persons.

Guideline

The following chart identifies the public and common use areas that should be made accessible, cites the appropriate section of the ANSI Standard, and describes the appropriate application of the specifications, including modifications to the referenced standard.

Accessible element or space	ANSI A117.1 Section	Application
1. Accessible route(s)...	4.3	<p>Within the boundary of the site:</p> <p>(a) From public transportation stops, accessible parking spaces, accessible passenger loading zones, and public streets or sidewalks to accessible building entrances (subject to site considerations described in Section 5).</p> <p>(b) Connecting accessible buildings, facilities, elements and spaces that are on the same site. On-grade walks or paths between separate buildings with covered multifamily dwellings, while not required, should be accessible unless the slope of finish grade exceeds 8.33% at any point along the route. Handrails are not required on these accessible walks.</p> <p>(c) Connecting accessible building or facility entrances with accessible spaces and elements within the building or facility, including adaptable dwelling units.</p> <p>(d) Where site or legal constraints prevent a route accessible to wheelchair users between covered multifamily dwellings and public or common-use facilities elsewhere on the site, an acceptable alternative is the provision of access via a vehicular route so long as there is accessible parking on an accessible route to at least 2% of covered dwelling units and necessary site provisions such as parking and curb cuts are available at the public or common use facility.</p>
2. Protruding objects.....	4.4	Accessible routes or maneuvering space including floors, walks, ramps, stairs, and curb ramps.
3. Ground and floor surface treatments....	4.5	Accessible routes, rooms, and spaces, including floors, walks, ramps, stairs, and curb ramps.
4. Parking and passenger loading zones.....	4.6	If provided at the site, designated accessible parking at the dwelling unit on request of residents with handicaps on the same terms and with the full range of choices (e.g., surface parking or garage) that are provided for other residents of the project with accessible parking on a route accessible to wheelchairs for at least 2% of the covered dwelling units: accessible visitor parking sufficient to provide access to grade level entrances of covered multifamily dwellings; and accessible parking at facilities (e.g., swimming pools) that serve accessible buildings.
5. Curb ramps	4.7	Accessible routes crossing curbs.
6. Ramps	4.8	Accessible routes with slopes greater than 1:20.
7. Stairs	4.9	Stairs on accessible routes connecting levels not connected by an elevator.
8. Elevator	4.10	If provided.
9. Platform lift	4.11	May be used in lieu of an elevator or ramp under certain conditions.
10. Drinking fountains and water coolers	4.15	Fifty percent of fountains and coolers on each floor, or at least one, if provided in the facility or at the site.
11. Drinking fountains and bathing facilities (including water closets, toilet rooms and stalls, urinals. Lavatories and mirrors, bathtubs, shower stalls, and sinks.)	4.22	Where provided in public-use and common-use facilities, at least one of each fixture provided per room.
12. Seating, tables, or work surfaces	4.30	If provided in accessible spaces, at least one of each type provided.
13. Places of assembly	4.31	If provided in the facility or at the site.
14. Common-use spaces and facilities (including swimming pools, playgrounds, entrances, rental offices, lobbies, elevators, mailbox areas, lounges, halls and corridors, and the like.)	4.1 through 4.30	<p>If provided in the facility or at the site:</p> <p>(a) Where multiple recreational facilities (e.g., tennis courts) are provided sufficient accessible facilities or each type to assure suitable opportunity for use by areas, lounges, persons with handicaps.</p> <p>(b) Where practical access to all or a portion of nature trails and jogging paths.</p>
15. Laundry rooms	4.32.6	If provided in the facility or at the site, at least one or each type of appliances provided in each laundry area, except that laundry rooms serving covered multiple-family dwellings would not be required to have front-loading washers in order to meet the requirements of 100.205(c)(1). (Where front-loading washers are not provided, management will be expected to provide assistive devices on request if necessary to permit a resident to use a top loading washer.)

Requirement 3. Usable doors.

Section 100.205(c)(2) provides that covered multifamily dwellings with a building entrance on an accessible route shall be designed in such a manner that all the doors designed to allow passage by handicapped persons in wheelchairs.

Guideline

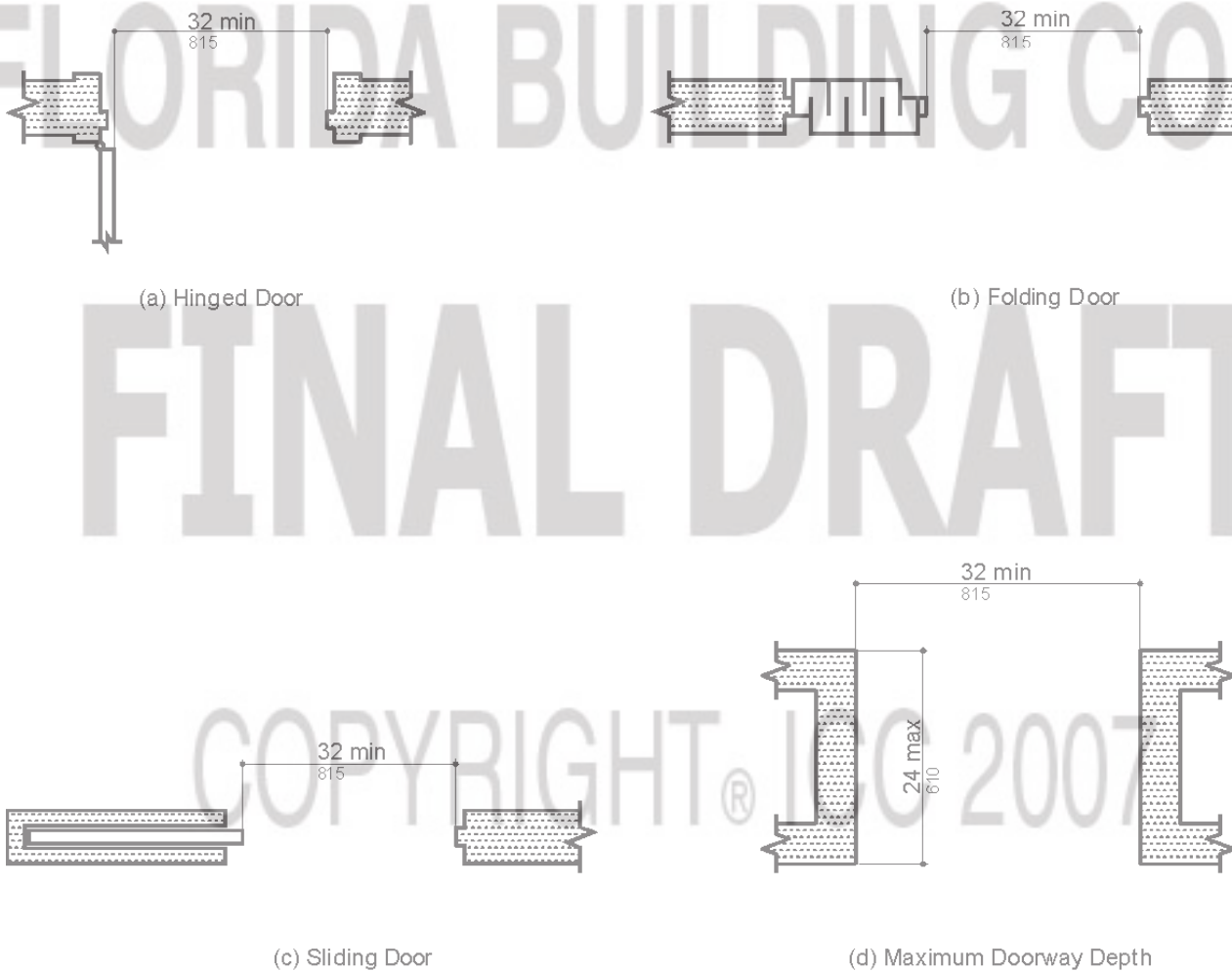
Section 100.205(c)(2) would apply to doors that are a part of an accessible route in the public and common use areas of multifamily dwellings and to doors into and within individual dwelling units.

(1) On accessible routes in public and common use areas, and for primary entry doors to covered units, doors that comply with ANSI 4.13 would meet this requirement.

(2) Within individual dwelling units, doors intended for user passage through the unit which have a clear opening of at least 32 inches nominal width when the door is open 90 degrees, measured between the face of the door and the stop, would meet this requirement. (See Fig. 1 (a), (b), and (c).) Openings more than 24 inches in depth are not considered doorways. (See Fig. 1 (d).)

Note:

A 34-inch door, hung in the standard manner, provides an acceptable nominal 32-inch clear opening. This door can be adapted to provide a wider opening by using offset hinges, by removing lower portions of the door stop, or both. Pocket or sliding doors are acceptable doors in covered dwelling units and have the added advantage of not impinging on clear floor space in small rooms. The nominal 32-inch clear opening provided by a standard six-foot sliding patio door assembly is acceptable.



**FIGURE 1
CLEAR DOORWAY WIDTH AND DEPTH**

Requirement 4 - Accessible route into and through the covered dwelling unit.

Section 100.205(c)(3)(i) provides that covered multifamily dwellings with a building entrance on an accessible route shall be designed and constructed in such a manner that all premises within covered multifamily dwelling units contain an accessible route into and through the covered dwelling unit.

Guideline

Accessible routes into and through dwelling units would meet Section 100.205(c)(3)(i) if:

- (1) A minimum clear width of 36 inches is provided.
- (2) In single-story dwelling units, changes in level within the dwelling unit with heights between 1/4 inch and 1/2 inch are beveled with a slope no greater than 1:2. Except for design features, such as a loft or an area on a different level within a room (e.g., a sunken living room), changes in level greater than 12 inch are ramped or have other means of access. Where a single story dwelling unit has special design features, all portions of the single-story unit, except the loft or the sunken or raised area, are on an accessible route; and
 - (a) In single-story dwelling units with lofts, all spaces other than the loft are on an accessible route.
 - (b) Design features such as sunken or raised functional areas do not interrupt the accessible route through the remainder of the dwelling unit.
- (3) In multistory dwelling units in buildings with elevators, the story of the unit that is served by the building elevator (a) is the primary entry to the unit, (b) complies with Requirements 2 through 7 with respect to the rooms located on the entry/accessible floor; and (c) contains a bathroom or powder room which complies with Requirement 7. (Note: multistory dwelling units in non-elevator buildings are not covered dwelling units because, in such cases, there is no ground floor unit).
- (4) Except as provided in Paragraphs (5) and (6) below, thresholds at exterior doors, including sliding door tracks, are no higher than 3/4 inch. Thresholds and changes in level at these locations are beveled with a slope no greater than 1:2.

(5) Exterior deck, patio, or balcony surfaces are no more than 1/2 inch below the floor level of the interior of the dwelling unit, unless they are constructed of impervious material such as concrete, brick or flagstone. In such case the surface is no more than 4 inches below the floor level of the interior of the dwelling unit, or lower if required by local building code.

(6) At the primary entry door to dwelling units with direct exterior access, outside landing surfaces constructed of impervious materials such as concrete, brick or flagstone, are no more than 1/2 inch below the floor level of the interior of the dwelling unit. The finished surface of this area that is located immediately outside the entry may be sloped, up to 1/8 inch per foot (12 inches), for drainage.

Requirement 5 - Light switches, electrical outlets, thermostats and other environmental controls in accessible locations.

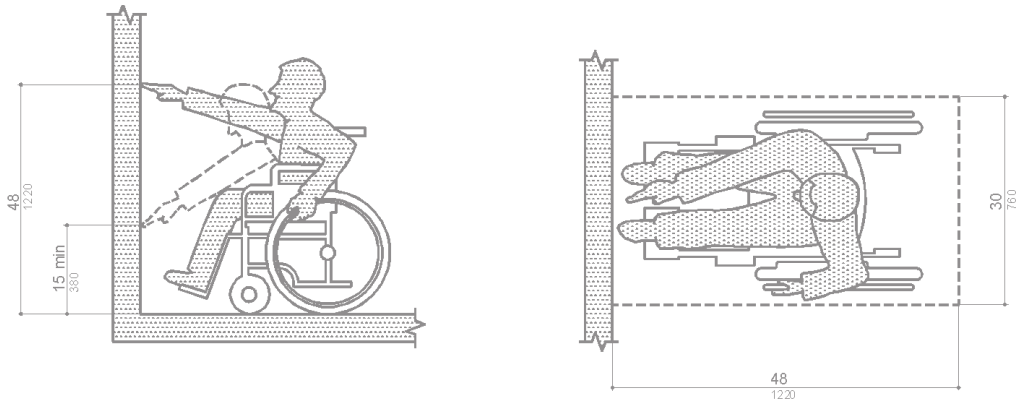
Section 100.205(c)(3)(ii) requires that all covered multifamily dwellings with a building entrance on an accessible route shall be designed and constructed in such a manner that all premises within covered multifamily dwelling unit contain light switches, electrical outlets, thermostats, and other environmental controls in accessible locations.

Guideline

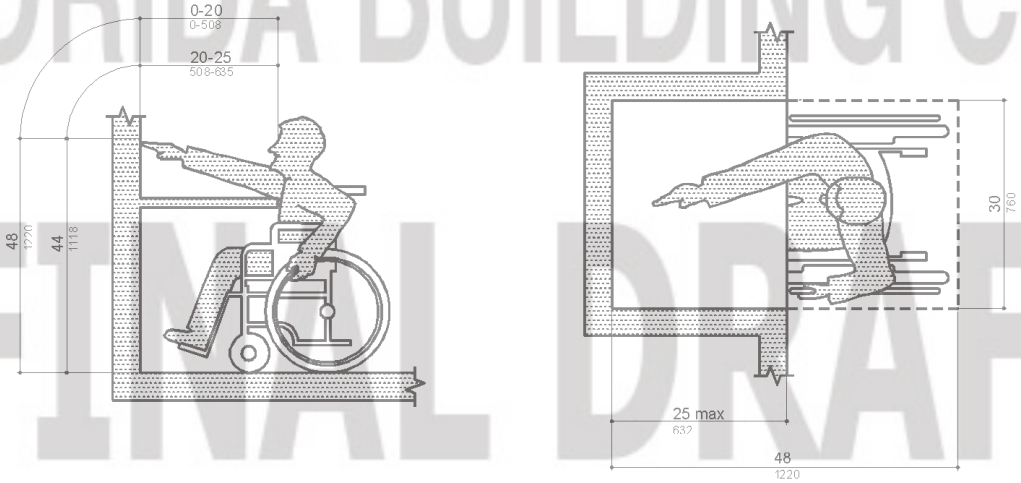
Light switches, electrical outlets, thermostats and other environmental controls would meet Section 100.205(c)(3)(ii) if operable parts of the controls are located no higher than 48 inches, and no lower than 15 inches, above the floor. If the reach is over an obstruction (for example, an overhanging shelf) between 20 and 25 inches in depth, the maximum height is reduced to 44 inches for forward approach; or 46 inches for side approach, provided the obstruction (for example, a kitchen base cabinet) is no more than 24 inches in depth. Obstructions should not extend more than 25 inches from the wall beneath a control (See Figure FHAG-2.)

Note:

Controls or outlets that do not satisfy these specifications are acceptable provided that comparable controls or outlets (i.e., that perform the same functions) are provided within the same area and are accessible, in accordance with this guideline for Requirement 5.

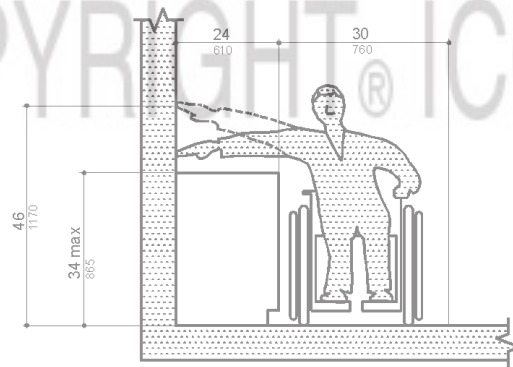


(a)
Forward Reach Limit



NOTE: Clear knee space should be as deep as the reach distance

(b)
Maximum Forward Reach Over an Obstruction



(c)
Maximum Side Reach Over Obstruction

**FIGURE 2
REACH RANGES**

Requirement 6 - Reinforced walls for grab bars.

Section 100.205(c)(3)(iii) requires that covered multifamily dwellings with a building entrance on an accessible route shall be designed and constructed in such a manner that all premises within covered multifamily dwelling units contain reinforcements in bathroom walls to allow later installation of grab bars around toilet, tub, shower stall and shower seat, where such facilities are provided.

Guideline

Reinforced bathroom walls to allow later installation of grab bars around the toilet, tub, shower stall and shower seat, where such facilities are provided, would meet Section 100.205(c)(3)(iii) if reinforced areas are provided at least at those points where grab bars will be mounted. (For example, see Fig. 3, 4 and 5.) Where the toilet is not placed adjacent to a side wall, the bathroom would comply if provision was made for installation of floor mounted, foldaway or similar alternative grab bars. Where the power room (a room

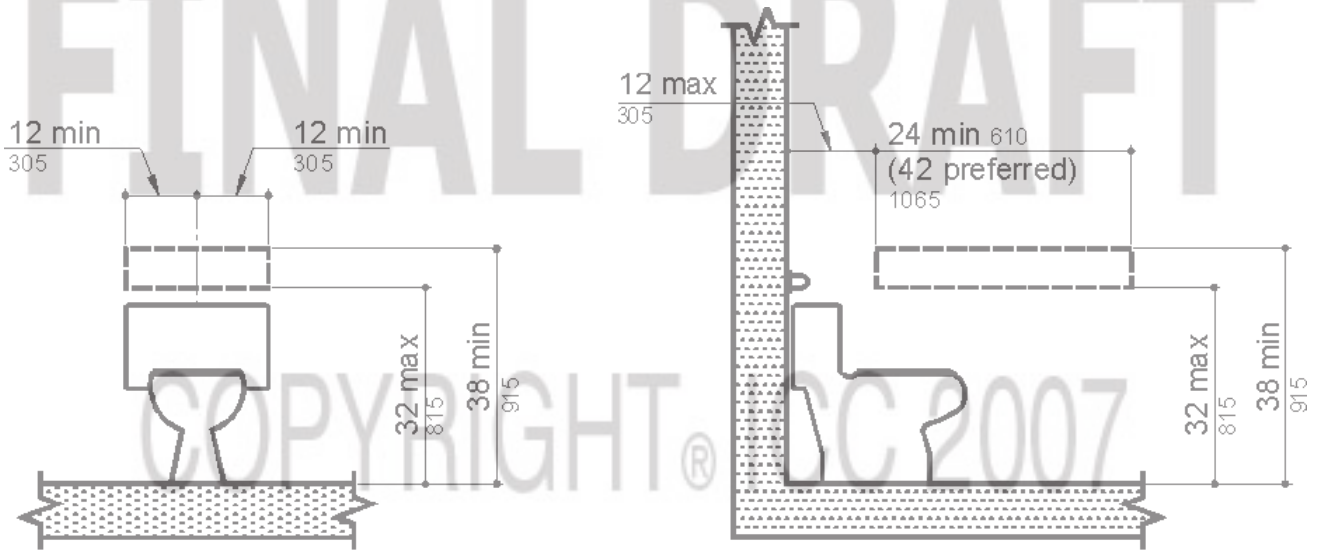
with a toilet and sink) is the only toilet facility located on an accessible level of a multistory dwelling unit, it must comply with this requirement for reinforced walls for grab bars.

Note:

Installation of bathtubs is not limited by the illustrative figures; a tub may have shelves or benches at either end; or a tub may be installed without surrounding walls, if there is provision for alternative mounting of grab bars. For example, a sunken tub placed away from walls could have reinforced areas for installation of floor-mounted grab bars. The same principle applies to shower stalls - e.g., glass-walled stalls could be planned to allow floor-mounted grab bars to be installed later.

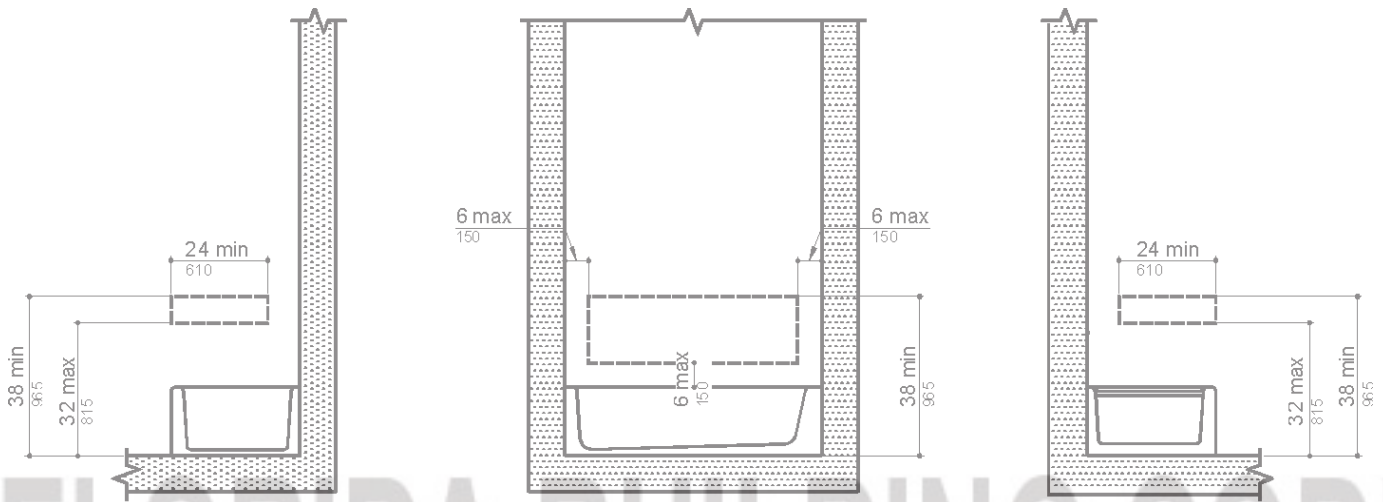
Reinforcement for grab bars may be provided in a variety of ways (for example, by plywood or wood blocking) so long as the necessary reinforcement is placed so as to permit later installation of appropriate grab bars.

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Reinforced areas for installation of Grab Bars

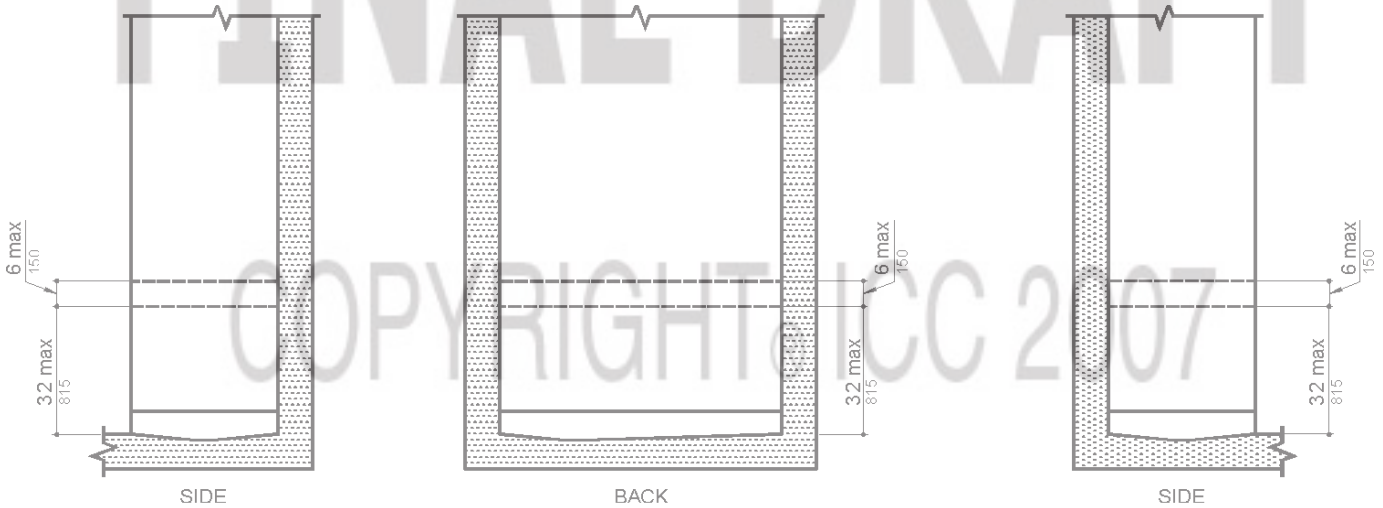
FIGURE 3
WATER CLOSETS IN ADAPTABLE BATHROOMS



NOTE: The areas outlined in dashed lines represent locations for future installation of grab bars for typical fixture configurations.

FIGURE 4
LOCATION OF GRAB BAR REINFORCEMENTS FOR ADAPTABLE BATHTUBS

NOTE: The areas outlined in dashed lines represent locations for future installations of grab bars for typical fixture configurations.



NOTE: The areas outlined in dashed lines represent locations for future installation of grab bars

FIGURE 5
LOCATION OF GRAB BAR REINFORCEMENTS FOR ADAPTABLE SHOWERS

NOTE: The areas outlined in dashed lines represent locations for future installations of grab bars.

Requirement 7 - Usable kitchens and bathrooms.

Section 100.205(c)(3)(iv) requires that covered multifamily dwellings with a building entrance on an accessible route shall be designed and constructed in such a manner that all premises within covered multifamily dwelling units contain usable kitchens and bathrooms such that an individual in a wheelchair can maneuver about the space.

Guideline

(1) Usable kitchens. Usable kitchens would meet Section 100.205(c)(3)(iv) if:

(a) A clear floor space at least 30 inches by 48 inches that allows a parallel approach by a person in a wheelchair is provided at the range or cooktop and sink and either a parallel or forward approach is provided at oven, dish washer, refrigerator/freezer or trash compactor. (See Figure FHAG-6)

(b) Clearance between counters and all opposing base cabinets, countertops, appliances or walls is at least 40 inches.

(c) In U-shaped kitchens with sink or range or cooktop at the base of the "U", a 60-inch turning radius is provided to allow parallel approach, or base cabinets are removable at that location to allow knee space for a forward approach.

(2) Usable bathrooms. To meet the requirements of Section 100.205(c)(3)(iv) either:

All bathrooms in the dwelling unit comply with option 2, or the provisions of Paragraph (a); or

At least one bathroom in the dwelling unit complies with the provisions of Paragraph (b), and all other bathrooms and powder rooms within the dwelling unit must be on an accessible route with usable entry doors in accordance with the guidelines for Requirements 3 and 4.

However, in multistory dwelling units, only those bathrooms on the accessible level are subject to the requirements of Section 100.205(c)(3)(accessibility). Where a powder room is the only facility provided on the accessible level of a multistory dwelling unit, the powder room must comply with provisions of Paragraph (a) or Paragraph (b). Powder rooms that are subject to the requirements of Section 100.205(c)(3)(iv) must have reinforcements for grab bars as provided in the guideline for Requirement 6.

(a) Bathrooms that have reinforced walls for grab bars (see Requirement 6) would meet Section 100.205(c)(3)(iv) if:

(i) Sufficient maneuvering space is provided within the bathroom for a person using a wheelchair or other mobility aid to enter and close the door, use the fixtures, reopen the door and exit. Doors may swing into the clear floor space provided at any fixture if the maneuvering space is provided. Maneuvering spaces may include any knee space or toespace available below bathroom fixtures.

(ii) Clear floor space is provided at fixtures as shown in Figure FHAG-7(a), Figure FHAG-7(b), Figure FHAG-7(c) and Figure FHAG-7(d). Clear floor space at fixtures may overlap.

(iii) If the shower stall is the only bathing facility provided in the covered dwelling unit, the shower stall measures at least 36 inches x 36 inches.

Note:

Cabinets under lavatories are acceptable provided the bathroom has space to allow a parallel approach by a person in a wheelchair; if parallel approach is not possible within the space, any cabinets provided would have to be removable to afford the necessary knee clearance for forward approach.

(b) Bathrooms that have reinforced walls for grab bars (see Requirement 6) would meet Section 100.205(c)(3)(iv) if:

(i) Where the door swings into the bathroom, there is a clear space (approximately 2'6" by 4'0") within the room to position a wheelchair or other mobility aid clear of the path of the door as it is closed and to permit use of fixtures. This clear space can include any knee space and toespace available below bathroom fixtures.

(ii) Where the door swings out, a clear space is provided within the bathroom for a person using a wheelchair or other mobility aid to position the wheelchair such that the person is allowed use of fixtures. There also shall be clear space to allow persons using wheelchairs to reopen the door to exit.

(iii) When both tub and shower fixtures are provided in the bathroom, at least one is made accessible. When two or more lavatories in a bathroom are provided, at least one is made accessible.

(iv) Toilets are located within bathrooms in a manner that permit a grab bar to be installed on one side of the fixture. In locations where toilets are adjacent to walls or bathtubs, the center line of the fixture is a minimum of 1'6" from the obstacle. The other (non-grab bar) side of the toilet fixture is a minimum of 1'3" from the finished surface of adjoining walls, vanities or from the edge of a lavatory. (See Figure FHAG-7(a).)

(v) Vanities and lavatories are installed with the centerline of the fixture a minimum of 1'3" horizontally from an adjoining wall or fixture. The top of the fixture rim is a maximum height of 2'10" above the finished floor. If knee space is provided below the vanity, the bottom of the apron is at least 2'3" above the floor. If provided, full knee space (for front approach) is at least 1'5" deep. (See Figure FHAG-7(c).)

(vi) Bathtubs and tub/showers located in the bathroom provide a clear access aisle adjacent to the lavatory that is at least 2'6" wide and extends for a length of 4'0" (measured from the foot of the bathtub). (See Figure FHAG-8.)

(vii) Stall showers in the bathroom may be of any size or configuration. A minimum clear floor space 2'6" wide by 4'0" should be available outside the stall. (See Figure FHAG-7(d).) If the shower stall is the only bathing facility provided in the covered dwelling unit, or on the accessible level of a covered multistory unit, and measures a nominal 36 x 36, the shower stall must have reinforcing to allow for installation of an optional wall hung bench seat.

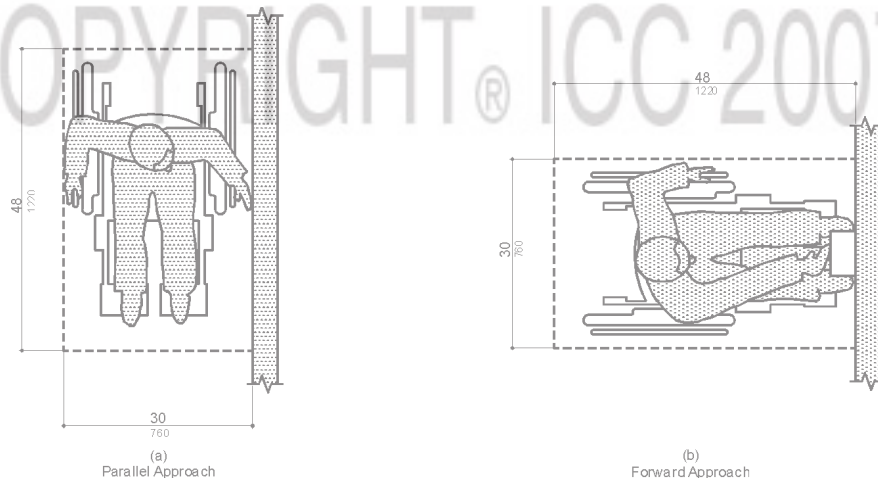
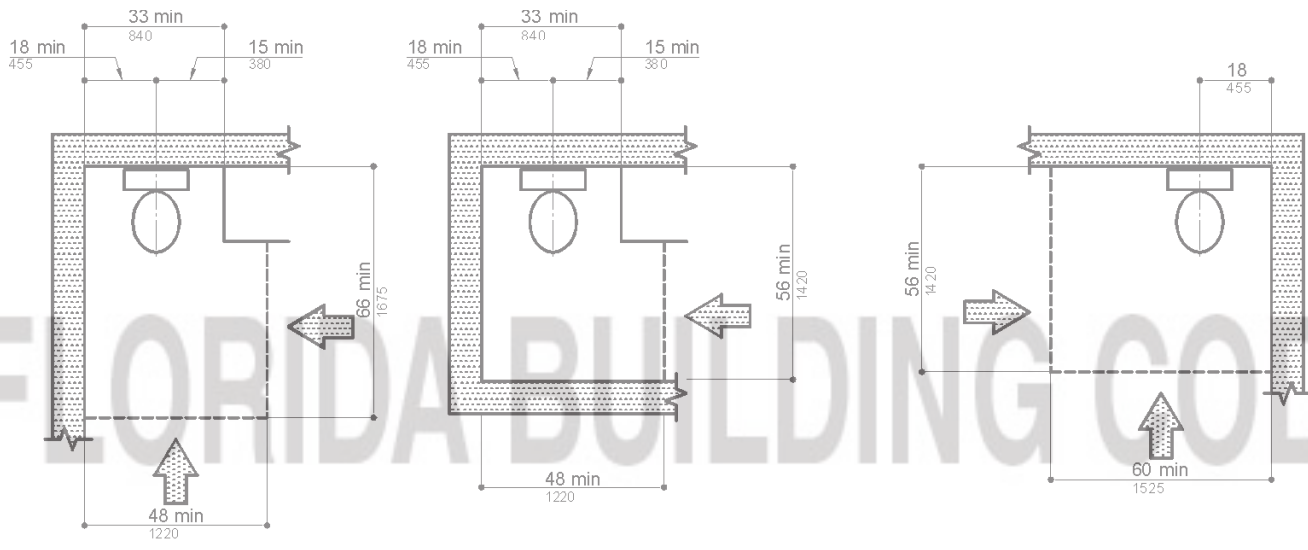


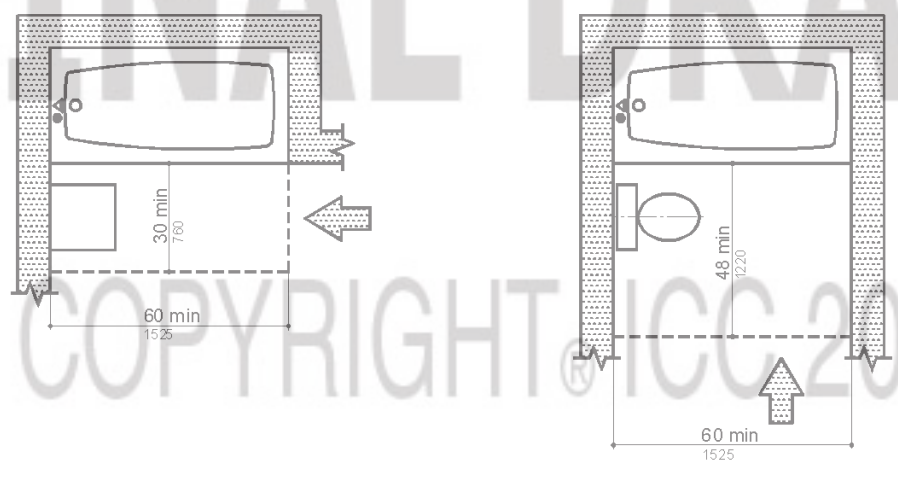
FIGURE 6
MINIMUM CLEAR FLOOR SPACE FOR WHEELCHAIRS

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(a) Clear Floor Space at Water Closets

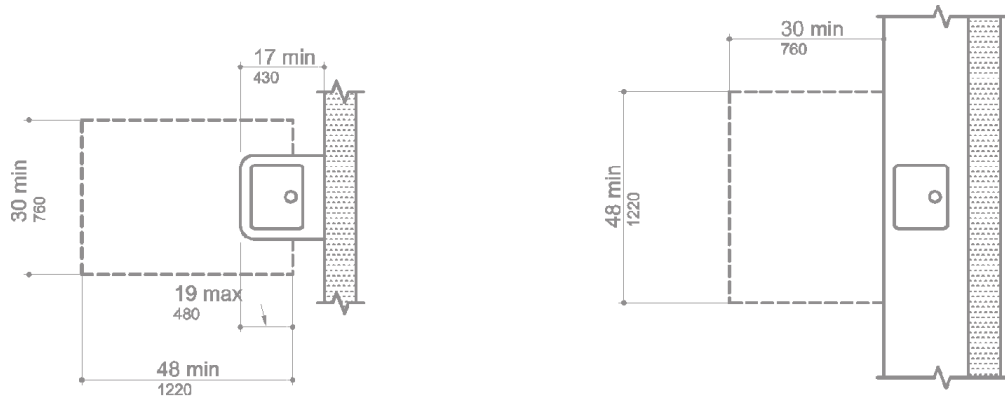
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(b) Clear Floor Space at Bathtubs

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FIGURE 7
CLEAR FLOOR SPACE FOR ADAPTABLE BATHROOMS

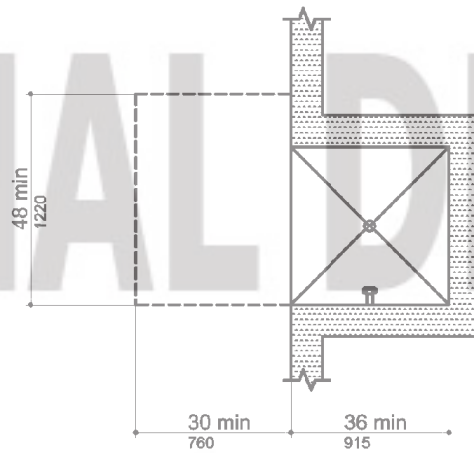


Lavatory With Knee Space

Lavatory Without Knee Space

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(c) Clear Floor Space at Lavatories



(d) Clear Floor Space at Shower

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FIGURE 7 (continued)
CLEAR FLOOR SPACE FOR ADAPTABLE BATHROOMS

NOTE: Clear floor space beside tub may overlap with clear floor space beneath adjacent fixtures.

Government Printing Office: 1992 - 312-222/4111

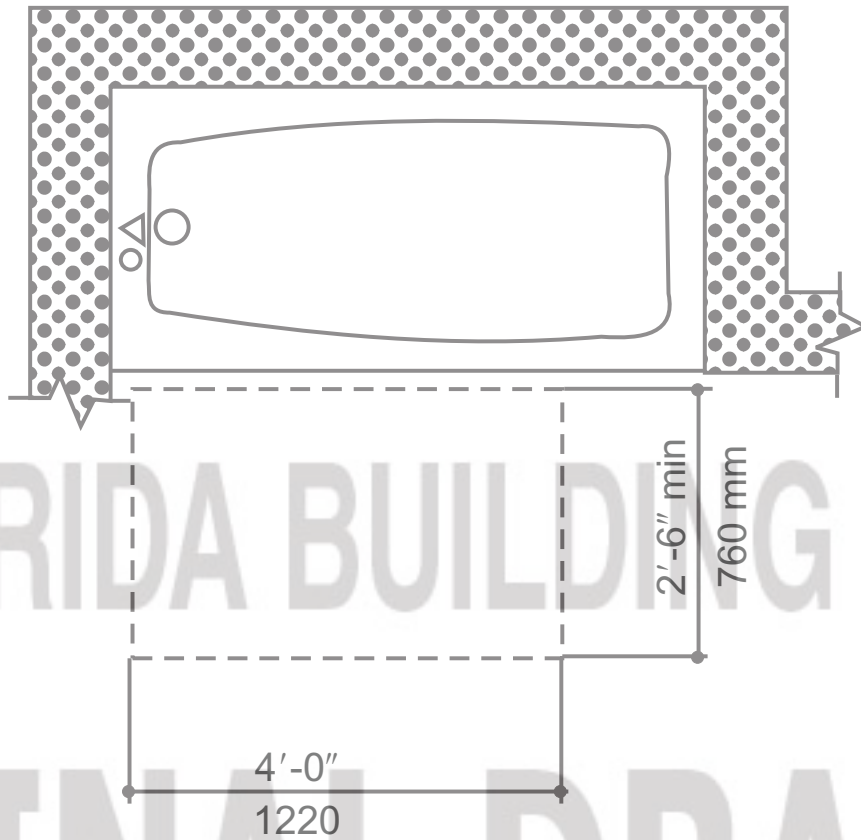


FIGURE 8
ALTERNATIVE SPECIFICATION - CLEAR FLOOR SPACE AT BATHTUB

Appendix III to Ch.I, Subchapter A —
Preamble to Final Housing Accessibility
Guidelines (Published March 6, 1991).

(FR Doc. 91-5228 Filed 3-5-91; 8:45 am)

BILLING CODE 4210-38-M

BILLING CODE 4210-24-C

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CHAPTER 11
REQUEST FOR WAIVER FROM ACCESSIBILITY REQUIREMENTS
CHAPTER 553, PART V, FLORIDA STATUTES
August 1999
PART C

NOTICE TO WAIVER APPLICANTS

Please make certain you comply with the following:

- The person submitting the waiver request application as the Applicant **MUST** sign the application. Should you fail to do so, your application will be returned.
- If a design professional (architect or engineer) has designed the project, his or her comments **MUST** be included as a part of this application.
- Be as explicit as possible. The more information provided to the Florida Building Commission (The Commission), the more informed its decisions can be. If you are claiming financial hardship, please specify why and to what degree.
- If at all possible, **PLAN TO ATTEND the Accessibility Advisory Council (The Council) and the Commission Meetings**. Sometimes pertinent facts are inadvertently omitted, or information provided/presented in the Request for Waiver application is not clear. Your attendance at the meetings to answer questions will enhance the possibility of the waiver being approved, since the Council and the Commission will receive the most complete information—from you. When we receive the completed application, we will send you a notice of the time, date, and place for both the Council and the Commission meetings.

Enclosed are: a **Checklist for Use by the Applicant**, a **List of Required Information**, the **Request for Waiver** application, and a copy of the administrative rule governing the Florida Building Commission procedures for reviewing requests for waivers from accessibility requirements.

If you have questions or would like additional information, please call the Codes and Standards Office at (850) 487-1824.

This application is available in electronic format at:
http://www.dca.state.fl.us/fhcd/fbc/access_waiver/waiverap.htm

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Department of Community Affairs
FLORIDA BUILDING COMMISSION
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100

NOTICE TO WAIVER APPLICANTS

Please make certain you comply with the following:

- The person submitting the waiver request application as the Applicant MUST sign the application. Should you fail to do so, your application will be returned.
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- Be as explicit as possible. The more information provided to the Florida Building Commission, the more informed its decisions can be. If you are claiming financial hardship, please specify why and to what degree.
- If at all possible, **PLAN TO ATTEND the Accessibility Advisory Council and the Florida Building Commission meetings.** Sometimes pertinent facts are inadvertently omitted, or information provided/presented in the Request for Waiver application is not clear. Your attendance at the meetings to answer questions will enhance the possibility of the waiver being approved, since the Council and the Commission will receive the most complete information - from you. When we receive the completed application, we will send you a notice of the time, date, and place for both the Council and the Commission meetings.

Enclosed are a **List of Required Information** and the **Request for Waiver** application.

If you have questions or would like additional information, please call the Codes and Standards Section at (850)487-1824.

This application is available in electronic format at:
http://www.dca.state.fl.us/fhcd/fbc/access_waiver/waiverap.htm.

Please mail this application to the Department of Community Affairs at the address above. As well as a hard copy, please include a copy of the application (without drawings or plans) on a 3.5 floppy disk in PC format.

This application is available in alternate formats upon request.

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LIST OF REQUIRED INFORMATION:

1. _____ Drawings that will clearly present your project and that identify the issue(s) that relate to the waiver you are requesting. As a minimum, the following drawings must be submitted:
 - a. Project site plan
 - b. 24" x 36" minimum size drawings
 - c. Building/project sections (if necessary to assist in understanding the waiver request)
 - d. Enlarged floor plan(s) of the area in question
2. _____ One set of reduced scale (11" x 17") versions of the drawings submitted in item one above.
3. _____ One set of overhead transparencies (8-1/2" x 11") of the drawings submitted in item one above. When numerous features are shown on the drawings, please designate the location of the waiver items by highlighting or outlining in color the affected areas.
4. _____ When substantial financial cost of compliance is alleged, supporting cost estimates with quotes from at least two vendors or contractors and catalog information.
5. _____ If you feel photographs and/or renderings are necessary for your presentation, provide 40 legible color photocopies of the photographs and/or renderings. If color photocopies of photographs are provided, use a minimum size of 4" x 6" photographs with a maximum of two photographs per photocopied page.
6. _____ Please submit a hard copy of this application to the Department of Community Affairs, as well as a copy of the application on a 3.5 floppy disk in PC format. PLEASE NOTE: Do not submit drawings or plans on the disk.

General Information:

- a. **Equipment:** An overhead projector is provided at the presentation; any other equipment necessary for your presentation, such as TV/VCR, slide or LCD projectors, etc., is the responsibility of the applicant.
- b. **Verbal Descriptions:** Presentations may be to sight or hearing impaired persons; visual presentations should consider adequate verbal and text descriptions of charts and pictures.

Your application will be reviewed by the Accessibility Advisory Council. You will have the opportunity to answer questions and/or make a short presentation **not to exceed 15 minutes**. The Council will provide recommendations to the Florida Building Commission. The Commission will review the application. You will have another opportunity to answer questions and/or give a short presentation **not to exceed 15 minutes**. The Commission will consider all information and the Council's recommendation before voting on the waiver.

This application is available in alternate formats upon request.

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**REQUEST FOR WAIVER FROM ACCESSIBILITY REQUIREMENTS
CHAPTER 553, PART V, FLORIDA STATUTES**

Your application will be reviewed by the Accessibility Advisory Council and its recommendations will be presented to the Commission. You will have the opportunity to answer questions and/or make a short presentation, not to exceed 15 minutes, at each meeting. The Commission will consider all information presented and the Council's recommendation before voting on the waiver request.

1. Name and address of project for which the waiver is requested.

Name: _____

Address: _____

2. Name of Applicant. If other than the owner, please indicate relationship of applicant to owner and written authorization by owner in space provided:

Applicant's _____ **Name:** _____

Applicant's _____ **Address:** _____

Applicant's Telephone: _____ **FAX** _____

Applicant's _____ **E-mail** _____ **Address:** _____

Relationship _____ **to** _____ **Owner:** _____

Owner's Name _____

Owner's Address: _____

Owner's Telephone: _____ **FAX** _____

Owner's E-mail Address: _____

Signature of Owner: _____

Contact Person: _____

Contact Person's Telephone: _____ **E-mail Address:** _____

This application is available in alternate formats upon request.
Form No. 2001-01

3. Please check one of the following:

- New construction.
- Addition to a building or facility.
- Alteration to an existing building or facility.
- Historical preservation (addition).
- Historical preservation (alteration).

4. Type of Facility. Please describe the building (square footage, number of floors). Define the use of the building (i.e., restaurant, office, retail, recreation, hotel/motel, etc.)

5. Project Construction Cost (Provide cost for new construction, the addition or the alteration):

6. Project Status: Please check the phase of construction that best describes your project at the time of this application. Describe status.

- Under Design Under Construction*
- In Plan Review Completed*

* Briefly explain why the request has now been referred to the Commission.

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7. Requirements requested to be waived. Please reference the applicable section of the Florida law. Only Florida-specific accessibility requirements may be waived.

Issue

1: _____

Issue

2: _____

Issue

3: _____

8. Reason(s) for Waiver Request: The Florida Building Commission may grant waivers of Florida-specific accessibility requirements upon a determination of unnecessary, unreasonable or extreme hardship. Please describe how this project meets the following hardship criteria. Explain all that would apply for consideration of granting the waiver.

The hardship is caused by a condition or set of conditions affecting the owner which does not affect owners in general.

Substantial financial costs will be incurred by the owner if the waiver is denied.

The owner has made a **diligent investigation** into the costs of compliance with the code, but cannot find an efficient mode of compliance. Provide detailed cost estimates and, where appropriate, photographs. Cost estimates must include bids and quotes.

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9. Provide documented cost estimates for each portion of the waiver request and identify any additional supporting data which may affect the cost estimates. For example, for vertical accessibility, the lowest documented cost of an elevator, ramp, lift or other method of providing vertical accessibility should be provided, documented by quotations or bids from at least two vendors or contractors.

a. _____

b. _____

c. _____

10. Licensed Design Professional: Where a design professional has designed the project, his or her comments **MUST** be included and certified by signature and affixing of his or her professional seal. The comments must include the reason(s) why the waiver is necessary.

Signature

Printed Name

Phone Number _____

(SEAL)

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CERTIFICATION OF APPLICANT:

I hereby swear or affirm that the applicable documents in support of this Request for Waiver are attached for review by the Florida Building Commission and that all statements made in this application are to be the best of my knowledge true and correct.

Dated this _____ day of _____, 20 _____

Signature

Printed Name

By signing this application, the applicant represents that the information in it is true, accurate and complete. If the applicant misrepresents or omits any material information, the Commission may revoke any order and will notify the building official of the permitting jurisdiction. Providing false information to the Commission is punishable as a misdemeanor under Section 775.083, *Florida Statutes*.

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REVIEW AND RECOMMENDATION BY LOCAL BUILDING DEPARTMENT.

Please state why the issue is being referred to the Florida Building Commission as well as a recommendation for disposition. The building official or his or her designee should review the application and indicate that to the best of his or her knowledge, all information stipulated herein is true and accurate. Further, if this project is complete, explain why it is being referred to the Commission. The building official or his or her designee should sign a copy of the plans accompanying this application as certification that such plans are the same as those submitted for building department review. Please reference the applicable section of the Accessibility Code.

a. _____

b. _____

c. _____

Has there been any permitted construction activity on this building during the past three years? If so, what was the cost of construction?

Yes No Cost of Construction _____

Comments/Recommendation _____

Jurisdiction _____

Building Official or Designee _____

Signature

Printed Name

Certification Number

Telephone/FAX

Address _____

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Certification of Licensed Design Professional for Replicated Designs to be Placed on Consent Agenda

NOTE: This form is to be used only for cases in which design documents are duplicates of previously approved waivers and the project can be placed on a Consent Agenda pursuant to Rule 9B-7.003(3), Florida Administrative Code.

I, _____, a licensed architect/engineer in the state of Florida, whose Florida license number is _____, hereby state as follows:

1. I am the architect/engineer of record for the project known as (name of project) _____, for which the Owner seeks a waiver of one or more accessibility requirements in an application to which this Certification is attached.

2. I hereby certify that to the best of my knowledge and belief to the Florida Building Commission that the design documents for the (insert project described in paragraph 1 above) _____ are the same as the design documents previously submitted to the Commission and referenced in paragraph 3 below, except that the two projects are built or to be built on different parcels of land at different locations.

3. The licensed design professional of record (identify the licensed design professional of record), _____, prepared the design documents for the project known as _____, for which the majority of the Accessibility Advisory Council recommended approval and the Commission granted a waiver of one or more accessibility requirements in Final Order No. _____.

Printed Name: _____ Affix certification seal below:

Address: _____

Telephone: _____

Fax: _____

E-Mail Address: _____

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Certification of Applicant for Replicated Designs to be Placed on Consent Agenda

NOTE: This form is to be used only for cases in which design documents are duplicates of previously approved waivers and the project can be placed on a Consent Agenda pursuant to Rule 9B-7.003(3), Florida Administrative Code.

I, _____, am applying for placement on the Consent Agenda pursuant to Rule 9B-7.003(3), Florida Administrative Code. I (check one of the following and complete blanks):

I am the owner of this project (name of project) _____,
and was the owner of the project known as _____,

I am the franchisee of this project (name of project) _____,
am under the same franchiser (name of franchiser) _____
who was the franchiser of the project known as _____,

I am the licensee of this project (name of project) _____,
am under the same licensor (name of licensor) _____,
who was the licensor of the project known as _____,

for which the majority of the Accessibility Advisory Council recommended approval, and the Florida Building Commission granted a waiver of one or more accessibility requirements in Final Order No. _____.

I hereby swear or affirm that the above information to the best of my knowledge is true and correct.

Dated this _____ day of _____, 20 _____

Signature _____

Printed Name _____

Providing false information to the Florida Building Commission is punishable as a misdemeanor under Section 775.083, Florida Statutes.

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CHAPTER 9B-7

FLORIDA BUILDING COMMISSION — HANDI-
CAPPED ACCESSIBILITY STANDARDS

9B-7.001	Purpose. (Repealed)
9B-7.002	Definitions. (Repealed)
9B-7.003	Procedures.
9B-7.004	Prerequisites for Consideration of Waiver Requests. (Repealed)
9B-7.0041	Guidelines for Accessible Automated Teller Machines and Fare Vending Machines (Repealed)
9B-7.0042	Florida Accessibility Code for Building Construction.
9B-7.005	Criteria for Granting of Waiver. (Repealed)
9B-7.006	Filing of Requests. (Repealed)

9B-7.003 Procedures.

(1) All applications for a waiver or modification of the requirements of the Act or the Code shall be filed on the Request for Waiver, Forms No. 2001-01 and 2001-02, which the Commission hereby incorporates by reference, effective January 20, 2002. Copies of Forms No. 2001-01 and 2001-02 are available by writing to the Codes and Standards Section, Department of Community Affairs, 2555 Shumard Oak Boulevard, Tallahassee, Florida 32399-2100. Upon certification from an applicant that all information requested by these rules has been furnished, the request will be scheduled for consideration at the Commission's next scheduled meeting provided that at least 14 days notice can be given to the members of the Advisory Council.

(2) All Requests shall be prepared in accordance with the instructions on Form 1997-03, but the Commission may waive a requirement in the instructions if the Commission finds the requirement unnecessary to the consideration of the Request. A Request shall be for one Project only, and no Request shall be considered by the Commission unless it shall have first been reviewed by the Council.

(3) The Commission and the Council may delegate to staff the authority to review an application and place it on a consent agenda only in the following circumstances:

- (a) A majority of the Council has recommended approval of a waiver application accompanied by a particular set of design documents;
- (b) The Commission has ordered a waiver based on the same set of design documents; and
- (c) The Project for which application for a waiver is made is:
 1. Owned by the same owner, franchised by the same franchiser, or licensed by the same licensor as the project previously approved by the Commission; and
 2. To be built according to the same set of design documents previously approved by the Commission; and
 3. The design documents described in 2. above have been certified by the architect of record using Form No. 1997-04, which the Commission hereby incorporates by reference, effective October 1, 1997. Copies of Form No. 1997-04 are available by writing to the Codes and Standards Section, Department of Community Affairs, 2555 Shumard Oak Boulevard, Tallahassee, Florida 32399-2100; and
- (d) The delegation has been entered in the minutes of the meetings of the Commission and of the Council. The Commission may, upon the request of any Commission member, remove an application from the consent agenda. If an application is removed from the consent agenda, it shall be placed on the agenda for hearing in sequence that day.

(4) At its meetings, the Council shall consider all Requests, and shall prepare a recommendation for the Commission on each Request. The recommendation may be for approval, approval for a specified time, approval with a specified condition, or disapproval. If the Council finds that the Request does not give it sufficient information to make a recommendation, it may

also recommend that the Commission defer action on the Request until such information is furnished. In the absence of a quorum, individual members of the Council may present recommendations to the Commission.

(5) At the meeting of the Commission, the Chairman of the Council or his designee shall present the recommendations of the Council on each Request. At its discretion, the Commission may hear any argument in support of or opposition to any Request and it may at its discretion vote upon more than one Request together. In acting upon a Request, at its discretion the Commission may wholly or partly agree or disagree with the recommendation of the Council, and may approve any Request, may approve it for a specified time, may approve it with a specified condition, may disapprove it, or may defer it for additional information.

(6) The Commission may waive one or more requirements of the Act or the Code if it finds that compliance with the literal requirements will cause an unnecessary, unreasonable, or extreme hardship. A waiver or denial of a waiver shall be applicable only to the project in the Request, and no waiver shall stand as precedent for any other project or projects. In order for the Commission to find an unnecessary, unreasonable, or extreme hardship, the owner of the project must show the following:

- (a) That the hardship is caused by a condition or set of conditions affecting the owner which does not affect owners in general.
- (b) That substantial financial costs will be incurred by the owner if the waiver is denied.
- (c) That the owner has made a diligent investigation into the costs of compliance with the Code, but cannot find an efficient mode of compliance.

(7) The Commission shall reflect its action in a Final Order. The original of each Final Order shall be filed with the Clerk of the Department, who shall also act as Clerk of the Commission. Copies of each Final Order shall be sent by United States mail to the owner, to all professionals engaged in designing or building the project, and to the Building Official of the permitting jurisdiction. In addition, pertinent information concerning each Final Order shall be entered in a Master Topical Index of Final Orders, which shall be maintained by the Clerk of the Commission.

Specific Authority 553.512(1) FS. Law Implemented 553.512(1) FS. History—New 1-31-79, Formerly 9B-7.03, Amended 10-1-96, 9-14-97, 9-7-00, 1-20-02.

9B-7.0042 Florida Accessibility Code for Building Construction.

The 1997 Florida Accessibility Code for Building Construction (the Code) is adopted by reference as the rule of this Commission, effective October 1, 1997. The 2001 revision to the Code are herein incorporated into this rule by reference and shall take effect on the effective date of this rule. Copies of the Code and the 2001 revision are available by writing to the Codes and Standards Section, Department of Community Affairs, 2555 Shumard Oak Boulevard, Tallahassee, Florida 32399-2100.

Specific Authority 553.503 FS. Law Implemented 553.503 FS. History—New 9-14-97, Amended 10-31-99, 1-20-02.

CHAPTER 11 PART D
Section 553.501-513, Florida Statutes

ACCESSIBILITY BY HANDICAPPED PERSONS

553.501 Short title. Sections 553.501-553.513 may be cited as the “Florida Americans With Disabilities Accessibility Implementation Act.”

History.—s. 1, ch. 93-183.

553.502 Intent. The purpose and intent of Sections 553.501 through 553.513 is to incorporate into the law of this state the accessibility requirements of the Americans with Disabilities Act of 1990, Pub. L. No. 101-336, 42 U.S.C. ss. 12101 et seq., and to obtain and maintain United States Department of Justice certification of the *Florida Accessibility Code for Building Construction* as equivalent to federal standards for accessibility of buildings, structures, and facilities. All state laws, rules, standards, and codes governing facilities covered by the guidelines shall be maintained to assure certification of the state’s construction standards and codes. Nothing in Sections 553.501 through 553.513 is intended to expand or diminish the defenses available to a place of public accommodation under the Americans with Disabilities Act and the federal Americans with Disabilities Act Accessibility Guidelines (ADAAG), including, but not limited to, the readily achievable standard, and the standards applicable to alterations to places of public accommodation.

History.—s. 1, ch. 93-183; s. 1, ch. 97-76.

553.503 Adoption of guidelines. Subject to the exceptions in Section 553.504, the federal Americans with Disabilities Act Accessibility Guidelines, as adopted by reference in 28 C.F.R., part 36, subparts A and D, and Title II of Pub. L. No. 101-336, are hereby adopted and incorporated by reference as the law of this state. The guidelines shall establish the minimum standards for the accessibility of buildings and facilities built or altered within this state. The 1997 *Florida Accessibility Code for Building Construction* must be adopted by the Florida Building Commission in accordance with Chapter 120.

History.—s. 1, ch. 93-183; s. 2, ch. 97-76; s. 65, ch. 2000-141; s. 59, ch. 2000-154.

553.504 Exceptions to applicability of the guidelines. Notwithstanding the adoption of the ADAAG in Section 553.503, all buildings, structures, and facilities in this state shall meet the following additional requirements when they provide increased accessibility:

- (1) All new or altered buildings and facilities subject to Sections 553.501 through 553.513 which may be frequented in, lived in, or worked in by the public shall comply with Section 553.501 through 553.513.
- (2) All new single-family houses, duplexes, triplexes, condominiums, and townhouses shall provide at least one bathroom, located with maximum possible privacy, where bathrooms are provided on habitable grade levels, with a door that has a 29-inch (737 mm) clear opening. However, if only a toilet room is provided at grade level, such toilet room shall have a clear opening of not less than 29 inches.
- (3) All required doors and walk-through openings in buildings excluding single-family homes, duplexes, and triplexes not covered by the Americans with Disabilities Act of 1990 or the Fair Housing Act shall have at least 29 inches (737 mm) of clear width except under Sections 553.501 through 553.513.
- (4) In addition to the requirements in reference 4.8.4 of ADAAG, all landings on ramps shall be not less than 60 inches (1524 mm) clear, and the bottom of each ramp shall have not less than 72 inches (1829 mm) of straight and level clearance.
- (5) All curb ramps shall be designed and constructed in accordance with the following requirements:
 - (a) Notwithstanding the requirements of reference 4.8.5.2 of ADAAG, handrails on ramps which are not continuous shall extend not less than 18 inches (457 mm) beyond the sloped segment at both the top and bottom, and shall be parallel to the floor or ground surface.
 - (b) Notwithstanding the requirements of references 4.3.3 and 4.8.3 of ADAAG, curb ramps that are part of a required means of egress shall be not less than 44 inches (1118 mm) wide.
 - (c) Notwithstanding the requirements of reference 4.7.5 of ADAAG, curb ramps located where pedestrians must use them and all curb ramps which are not protected by handrails or guardrails shall have flared sides with a slope not exceeding a ratio of 1:12.

(6) Notwithstanding the requirements in reference 4.13.11 of ADAAG, exterior hinged doors shall be so designed that such doors can be pushed or pulled open with a force not exceeding 8.5 foot pounds.

(7) Notwithstanding the requirements in reference 4.33.1 of ADAAG, all public food service establishments, all establishments licensed under the Beverage Law for consumption on the premises, and all facilities governed by reference 4.1 of the guidelines shall provide seating or spaces for seating in accordance with the following requirements:

(a) For the first 100 fixed seats, accessible and usable spaces must be provided consistent with the following table:

Capacity of Seating In Assembly Areas	Number of Required Wheelchair Locations
1 to 25	1
26 to 50	2
51 to 100	4

(b) For all remaining fixed seats, there shall be not less than one such accessible and usable space for each 100 fixed seats or fraction thereof.

(8) Notwithstanding the requirements in references 4.32.1-4.32.4 of ADAAG, all fixed seating in public food service establishments, in establishments licensed under the Beverage Law for consumption on the premises, and in all other facilities governed by reference 4.1 of ADAAG shall be designed and constructed in accordance with the following requirements:

(a) All aisles adjacent to fixed seating shall provide clear space for wheelchairs.

(b) Where there are open positions along both sides of such aisles, the aisles shall be not less than 52 inches (1321 mm) wide.

(9) In motels and hotels a number of rooms equaling at least 5 percent of the guestrooms minus the number of accessible rooms required by ADAAG shall provide the following special accessibility features:

(a) Grab rails in bathrooms and toilet rooms that comply with Section 4.16.4 of ADAAG.

(b) All beds in designed accessible guest rooms shall be open-frame type to permit passage of lift devices.

(c) All standard water closet seats shall be at a height of 15 inches (381 mm), measured vertically from the finished floor to the top of the seat, with a variation of plus or minus 1/2 inch (12.7 mm). A portable or attached raised toilet seat shall be provided in all designated handicapped accessible rooms.

All buildings, structures, or facilities licensed as a hotel, motel, or condominium pursuant to Chapter 509 shall be subject to the provisions of this subsection. Nothing in this subsection shall be construed as relieving the owner

of the responsibility of providing accessible rooms in conformance with Sections 9.1 through 9.5 of ADAAG.

(10) Notwithstanding the requirements in reference 4.29.2 of the guidelines, all detectable warning surfaces required by the guidelines shall be governed by the requirements of ANSI A117.1-1986.

(11) Notwithstanding the requirements in references 4.31.2 and 4.31.3 of the guidelines, the installation and placement of all public telephones shall be governed by the rules of the Florida Public Service Commission.

(12) Notwithstanding the requirements in references 4.1.3(11) and 4.16-4.23 of ADAAG, required restrooms and toilet rooms in new construction shall be designed and constructed in accordance with the following requirements:

(a) The standard accessible restroom stall shall contain an accessible lavatory within it, the size of such lavatory to be not less than 19 inches wide by 17 inches (483 mm by 432 mm) deep, nominal size, and wall-mounted. The lavatory shall be mounted so as not to overlap the clear floor space areas required by Section 4.17, Figure 30(a) of ADAAG for the standard accessible stall and to comply with Section 4.19 of ADAAG. Such lavatories shall be counted as part of the required fixture count for the building.

(b) The accessible water closet shall be located in the corner, diagonal to the door.

(c) The accessible stall door shall be self-closing.

(13) All customer checkout aisles not required by the guidelines to be handicapped accessible shall have at least 32 inches (813 mm) of clear passage.

(14) Turnstiles shall not be used in occupancies which serve fewer than 100 persons, but turnstiles may be used in occupancies which serve at least 100 persons if there is an unlocked alternate passageway on an accessible route affording not less than 32 inches (813 mm) of clearance, equipped with latching devices in accordance with the guidelines.

(15) Barriers at common or emergency entrances and exits of business establishments conducting business with the general public that are existing, under construction, or under contract for construction which would prevent a person from using such entrances or exits shall be removed.

History.—s. 1, ch. 93-183; s. 3, ch. 97-76.

553.5041 Parking spaces for persons who have disabilities.

(1) This section is not intended to expand or diminish the defenses available to a place of public accommodation under the Americans with Disabilities Act and the federal ADAAG, including, but not limited to, the readily achievable standard, and the standards applicable to alterations to places of public accommodation. Subject to the exceptions described in subsections (2), (4), (5), and (6), when the parking and loading zone requirements of the federal ADAAG, as

adopted by reference in 28 C.F.R. part 36, subparts A and D, and Title II of Pub. L. No. 101-336, provide increased accessibility, those requirements are adopted and incorporated by reference as the law of this state.

(2) State agencies and political subdivisions having jurisdiction over street parking or publicly owned or operated parking facilities are not required to provide a greater right-of-way width than would otherwise be planned under regulations, guidelines, or practices normally applied to new development.

(3) If parking spaces are provided for self-parking by employees or visitors, or both, accessible spaces shall be provided in each such parking area. Such spaces shall be designed and marked for the exclusive use of those individuals who have a severe physical disability and have permanent or temporary mobility problems that substantially impair their ability to ambulate and who have been issued either a disabled parking permit under Section 316.1958 or 320.0848 or a license plate under Section 320.084, 320.0842, 320.0843 or 320.0845.

(4) The number of accessible parking spaces must comply with the parking requirements in ADAAG Section 4.1 and the following:

(a) There must be one accessible parking space in the immediate vicinity of a publicly owned or leased building that houses a governmental entity or a political subdivision, including, but not limited to, state office buildings and courthouses, if no parking for the public is provided on the premises of the building.

(b) There must be one accessible parking space for each 150 metered on-street parking spaces provided by state agencies and political subdivisions.

(c) The number of parking spaces for persons who have disabilities must be increased on the basis of demonstrated and documented need.

(5) Accessible perpendicular and diagonal accessible parking spaces and loading zones must be designed and located in conformance with the guidelines set forth in ADAAG ss. 4.1.2 and 4.6 and Appendix A4.6.,3 “Universal Parking Design.”

(a) All spaces must be located on an accessible route no less than 44 inches (1118 mm) wide so that users will not be compelled to walk or wheel behind parked vehicles.

(b) Each space must be located on the shortest safely accessible route from the parking space to an accessible entrance. If there are multiple entrances or multiple retail stores, the parking spaces must be dispersed to provide parking at the nearest accessible entrance. If a theme park or an entertainment complex as defined in Section 509.013(9) provides parking in several lots or areas from which access to the theme park or entertainment complex is provided, a single lot or area may be designated for parking by persons who have disabilities, if the lot or area is located on the shortest safely accessible route to an accessible entrance to the theme park or entertainment

complex or to transportation to such an accessible entrance.

(c)

1. Each parking space must be no less than 12 feet (3658 mm) wide. Parking access aisles must be no less than 5 feet (1524 mm) wide and must be part of an accessible route to the building or facility entrance. In accordance with ADAAG Section 4.6.3, access aisles must be placed adjacent to accessible parking spaces; however, two accessible parking spaces may share a common access aisle. The access aisle must be striped diagonally to designate it as a no-parking zone.

2. The parking access aisles are reserved for the temporary exclusive use of persons who have disabled parking permits and who require extra space to deploy a mobility device, lift, or ramp in order to exit from or enter a vehicle. Parking is not allowed in an access aisle. Violators are subject to the same penalties that are imposed for illegally parking in parking spaces that are designated for persons who have disabilities. A vehicle may not be parked in an access aisle, even if the vehicle owner or passenger is disabled or owns a disabled parking permit.

3. Any provision of this subsection to the contrary notwithstanding, a theme park or an entertainment complex as defined in Section 509.013(9) in which are provided continuous attendant services for directing individuals to marked accessible parking spaces or designated lots for parking by persons who have disabilities, may, in lieu of the required parking space design, provide parking spaces that comply with ADAAG Sections 4.1 and 4.6.

(d) On-street parallel parking spaces must be located either at the beginning or end of a block or adjacent to alley entrances. Such spaces must be designed in conformance with the guidelines set forth in ADAAG Sections 4.6.2 through 4.6.5.

Exception: Access aisles are not required.

Curbs adjacent to such spaces must be of a height that will not interfere with the opening and closing of motor vehicle doors. This subsection does not relieve the owner of the responsibility to comply with the parking requirements of ADAAG Sections 4.1 and 4.6.

(e) Parallel parking spaces must be even with surface slopes, may match the grade of the adjacent travel lane, and must not exceed a cross slope of 1:50, where feasible.

(f) Curb ramps must be located outside of the disabled parking spaces and access aisles.

(g)

1. The removal of architectural barriers from a parking facility in accordance with 28 C.F.R. Section 36.304 or with Section 553.508 must comply with this section unless compliance would cause the barrier removal not to be readily achievable. If compliance would cause the barrier removal not to be readily

achievable, a facility may provide parking spaces at alternative locations for persons who have disabilities and provide appropriate signage directing persons who have disabilities to the alternative parking if readily achievable. The facility may not reduce the required number or dimensions of those spaces, nor may it unreasonably increase the length of the accessible route from a parking space to the facility. The removal of an architectural barrier must not create a significant risk to the health or safety of a person who has a disability or to that of others.

2. A facility that is making alterations under Section 553.507(2)(b) must comply with this section to the maximum extent feasible. If compliance with parking location requirements is not feasible, the facility may provide parking spaces at alternative locations for persons who have disabilities and provide appropriate signage directing persons who have a disability to alternative parking. The facility may not reduce the required number or dimensions of those spaces, nor may it unnecessarily increase the length of the accessible route from a parking space to the facility. The alteration must not create a significant risk to the health or safety of a person who has a disability or to that of others.

(6) Each such parking space must be prominently outlined with blue paint, and must be repainted when necessary, to be clearly distinguishable as a parking space designated for persons who have disabilities and must be posted with a permanent above-grade sign of a color and design approved by the Department of Transportation, which is placed on or at a distance of 84 inches (2134 mm) above the ground to the bottom of the sign and which bears the international symbol of accessibility meeting the requirements of ADAAG Section 4.30.7 and the caption "PARKING BY DISABLED PERMIT ONLY." Such a sign erected after October 1, 1996, must indicate the penalty for illegal use of the space. Any provision of this section to the contrary notwithstanding, in a theme park or an entertainment complex as defined in Section 509.013(9) in which accessible parking is located in designated lots or areas, the signage indicating the lot as reserved for accessible parking may be located at the entrances to the lot in lieu of a sign at each parking place. This subsection does not relieve the owner of the responsibility of complying with the signage requirements of ADAAG Section 4.30.

History.—s. 66, ch. 2000-141.

553.505 Exceptions to applicability of the Americans with Disabilities Act. Notwithstanding the Americans with Disabilities Act of 1990, private clubs are governed by Sections 553.501 through 553.513. Parking spaces, parking lots, and other parking facilities are governed by Section 553.5041 when that section provides increased accessibility.

History.—s. 1, ch. 93-183; s. 14, ch. 96-200; s. 4, ch. 97-76; s. 23, ch. 2001-186.

553.506 Powers of the commission. In addition to any other authority vested in the Florida Building Commission by law,

the commission, in implementing Sections 553.501 through 553.513, may, by rule, adopt revised and updated versions of the ADAAG in accordance with Chapter 120.

History.—s. 1, ch. 93-183; s. 67, ch. 2000-141; s. 60, ch. 2000-154.

553.507 Exemptions. Sections 553.501 through 553.513 do not apply to any of the following:

(1) Buildings, structures, or facilities that were either under construction or under contract for construction on October 1, 1997.

(2) Buildings, structures, or facilities that were in existence on October 1, 1997, unless:

(a) The building, structure, or facility is being converted from residential to nonresidential or mixed use, as defined by local law;

(b) The proposed alteration or renovation of the building, structure, or facility will affect usability or accessibility to a degree that invokes the requirements of Section 303(a) of the Americans with Disabilities Act of 1990; or

(c) The original construction or any former alteration or renovation of the building, structure, or facility was carried out in violation of applicable permitting law.

History.—s. 1, ch. 93-183; s. 5, ch. 97-76; s. 31, ch. 2001-63; s. 24, ch. 2001-186.

553.508 Architectural barrier removal. Removal of architectural barriers, pursuant to 28 C.F.R. Section 36.304, from buildings, structures, or facilities to which this act applies shall comply with Sections 553.501 through 553.513 unless compliance would render the removal not readily achievable. In no instance shall the removal of an architectural barrier create a significant risk to the health or safety of an individual with a disability or others.

History.—s. 1, ch. 93-183.

553.509 Vertical accessibility. Nothing in Sections 553.501 through 553.513 or the guidelines shall be construed to relieve the owner of any building, structure, or facility governed by those sections from the duty to provide vertical accessibility to all levels above and below the occupiable grade level, regardless of whether the guidelines require an elevator to be installed in such building, structure, or facility, except for:

(1) Elevator pits, elevator penthouses, mechanical rooms, piping or equipment catwalks, and automobile lubrication and maintenance pits and platforms;

(2) Unoccupiable spaces, such as rooms, enclosed spaces, and storage spaces that are not designed for human occupancy, for public accommodations, or for work areas; and

(3) Occupiable spaces and rooms that are not open to the public and that house no more than five persons, including, but not limited to, equipment control rooms and projection booths.

However, buildings, structures, and facilities must, as a minimum, comply with the requirements in the ADAAG.

History.—s. 1, ch. 93-183; s. 6, ch. 97-76.

553.511 Parking facilities; minimum height clearance requirement. Every nonresidential structure built on or after January 1, 1991, which is designed to use covered or underground parking as the primary available parking space shall design the covered or underground parking facility to maintain a minimum height for the portion of the street-accessible level of the parking facility directly over van-accessible parking spaces and for providing ingress and egress to such parking spaces of at least 8 feet 2 inches (2489 mm). Signs shall be posted to warn operators of handicap-equipped vans that they cannot pass beyond a certain point due to height limitations. If compliance with this minimum height clearance requirement will cause the structure to exceed local height limitations imposed by local zoning, planning, or fire ordinances, or will result in the imposition of any additional requirements of such ordinances, the structure may exceed the height limitation specified in those particular codes as necessary to comply with the requirements of this section and is exempt from such additional requirements. Structures for which the plans were sealed by an architect prior to January 1, 1991, are exempt from this section.

History.—s. 2, ch. 90-250; s. 2, ch. 93-183; s. 7, ch. 97-76.

Note.—Former s. 553.482.

553.512 Modifications and waivers; advisory council.

(1) The Florida Building Commission shall provide by regulation criteria for granting individual modifications of, or exceptions from, the literal requirements of this part upon a determination of unnecessary, unreasonable, or extreme hardship, provided such waivers shall not violate federal accessibility laws and regulations and shall be reviewed by the Accessibility Advisory Council. Notwithstanding any other provision of this subsection, if an applicant for a waiver demonstrates economic hardship in accordance with 28 C.F.R. Section 36.403(f)(1), a waiver shall be granted. The commission may not consider waiving any of the requirements of s. 553.5041 unless the applicant first demonstrates that she or he has applied for and been denied waiver or variance from all local government zoning, subdivision regulations, or other ordinances that prevent compliance therewith. Further, the commission may not waive the requirement of Section 553.5041(5)(a) and (c)1. governing the minimum width of accessible routes and minimum width of accessible parking spaces.

(2) The Accessibility Advisory Council shall consist of the following seven members, who shall be knowledgeable in the area of accessibility for persons with disabilities. The Secretary of Community Affairs shall appoint the following: a representative from the Advocacy Center for Persons with Disabilities, Inc.; a representative from the Division of Blind Services; a representative from the Division of Vocational Rehabilitation; a representative from a statewide organization representing the physically handicapped; a representative from the hearing impaired; a representative from the

President, Florida Council of Handicapped Organizations; and a representative of the Paralyzed Veterans of America. The terms for the first three council members appointed subsequent to October 1, 1991, shall be for 4 years, the terms for the next two council members appointed shall be for three years, and the terms for the next two members shall be for two years. Thereafter, all council member appointments shall be for terms of four years. No council member shall serve more than two four-year terms subsequent to October 1, 1991. Any member of the council may be replaced by the secretary upon three unexcused absences. Upon application made in the form provided, an individual waiver or modification may be granted by the commission so long as such modification or waiver is not in conflict with more stringent standards provided in another chapter.

(3) Members of the council shall serve without compensation, but shall be entitled to reimbursement for per diem and travel expenses as provided by Section 112.061.

(4) Meetings of the advisory council shall be held in conjunction with the regular meetings of the commission.

History.—s. 3, ch. 78-333; s. 1, ch. 82-46; s. 2, ch. 83-265; s. 25, ch. 86-220; s. 5, ch. 89-97; ss. 1, 5, 6, ch. 91-172; s. 5, ch. 91-429; s. 2, ch. 93-183; s. 10, ch. 97-76; s. 68, ch. 2000-141; s. 61, ch. 2000-154; s. 13, ch. 2002-293.

Note.—Former s. 553.49.

553.513 Enforcement. It shall be the responsibility of each local government and each code enforcement agency established pursuant to Section 553.80 to enforce the provisions of this part. This act expressly preempts the establishment of handicapped accessibility standards to the state and supersedes any county or municipal ordinance on the subject. However, nothing in this section shall prohibit municipalities and counties from enforcing the provisions of this act.

History.—s. 6, ch. 89-97; s. 2, ch. 93-183.

Note.—Former s. 553.495.

CHAPTER 12

INTERIOR ENVIRONMENT

SECTION 1201 GENERAL

1201.1 Scope. The provisions of this chapter shall govern ventilation, temperature control, lighting, yards and courts, sound transmission, room dimensions, surrounding materials and rodent proofing associated with the interior spaces of buildings.

SECTION 1202 DEFINITIONS

1202.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SUNROOM

1. A room with roof panels that include sloped glazing that is a one-story structure added to an existing dwelling with an open or glazed area in excess of 40 percent of the gross area of the sunroom structure's exterior walls and roof.
2. A one-story structure added to a dwelling with structural roof panels without sloped glazing. The sunroom walls may have any configuration, provided the open area of the longer wall and one additional wall is equal to at least 65 percent of the area below 6 feet 8 inches of each wall, measured from the floor.

For the purposes of this code the term sunroom as used herein shall include conservatories, sunspaces, solariums, and porch or patio covers or enclosures.

SUNROOM ADDITION. A one-story addition added to an existing building with a glazing area in excess of 40 percent of the gross area of the structure's exterior walls and roof.

THERMAL ISOLATION. A separation of conditioned spaces, between a sunroom addition and a dwelling unit, consisting of existing or new wall(s), doors and/or windows.

SECTION 1203 VENTILATION

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *Florida Building Code, Mechanical*.

1203.2 Attic spaces. Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain and snow. Blocking and bridging shall be arranged so as not to interfere with the movement of air. A minimum of 1 inch (25 mm) of airspace shall be provided between the insulation and the roof sheathing. The net free ventilating

area shall not be less than $1/150$ of the area of the space ventilated, with 50 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents.

Exceptions:

1. The minimum required net free ventilating area shall be $1/300$ of the area of the space ventilated, provided a vapor retarder having a transmission rate not exceeding 1 perm in accordance with ASTM E 96 is installed on the warm side of the attic insulation and provided 50 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents, with the balance of the required ventilation provided by eave or cornice vents.
2. Attic spaces, designed by a Florida-licensed engineer or registered architect to eliminate the attic venting.

1203.2.1 Openings into attic. Exterior openings into the attic space of any building intended for human occupancy shall be covered with corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material that will prevent the entry of birds, squirrels, rodents, snakes and other similar creatures. The openings therein shall be a minimum of $1/8$ inch (3.2 mm) and shall not exceed $1/4$ inch (6.4 mm). Where combustion air is obtained from an attic area, it shall be in accordance with Chapter 7 of the *Florida Building Code, Mechanical*.

1203.3 Under-floor ventilation. The space between the bottom of the floor joists and the earth under any building except spaces occupied by a basement or cellar shall be provided with ventilation openings through foundation walls or exterior walls. Such openings shall be placed so as to provide cross ventilation of the under-floor space.

1203.3.1 Openings for under-floor ventilation. The minimum net area of ventilation openings shall not be less than 1 square foot for each 150 square feet (0.67 m² for each 100 m²) of crawl-space area. Ventilation openings shall be covered for their height and width with any of the following materials, provided that the least dimension of the covering shall not exceed $1/4$ inch (6 mm):

1. Perforated sheet metal plates not less than 0.070 inch (1.8 mm) thick.
2. Expanded sheet metal plates not less than 0.047 inch (1.2 mm) thick.
3. Cast-iron grilles or gratings.
4. Extruded load-bearing vents.
5. Hardware cloth of 0.035 inch (0.89 mm) wire or heavier.

6. Corrosion-resistant wire mesh, with the least dimension not exceeding $\frac{1}{8}$ inch (3.2 mm).

1203.3.2 Exceptions. The following are exceptions to Sections 1203.3 and 1203.3.1:

1. Where warranted by climatic conditions, ventilation openings to the outdoors are not required if ventilation openings to the interior are provided.
2. The total area of ventilation openings is permitted to be reduced to $\frac{1}{1,500}$ of the under-floor area where the ground surface is treated with an approved vapor retarder material and the required openings are placed so as to provide cross ventilation of the space. The installation of operable louvers shall not be prohibited.
3. Ventilation openings are not required where continuously operated mechanical ventilation is provided at a rate of 1.0 cubic foot per minute (cfm) for each 50 square feet (1.02 L/s for each 10 m²) of crawl-space floor area and the ground surface is covered with an approved vapor retarder.
4. Ventilation openings are not required when the ground surface is covered with an approved vapor retarder, the perimeter walls are insulated and the space is conditioned in accordance with Chapter 13 of *Florida Building Code, Building*.
5. Crawl spaces, designed by a Florida-licensed engineer or registered architect to eliminate the venting.

1203.4 Natural ventilation. Natural ventilation of an occupied space shall be through windows, doors, louvers or other openings to the outdoors. The operating mechanism for such openings shall be provided with ready access so that the openings are readily controllable by the building occupants.

1203.4.1 Ventilation area required. The minimum openable area to the outdoors shall be 4 percent of the floor area being ventilated.

1203.4.1.1 Adjoining spaces. Where rooms and spaces without openings to the outdoors are ventilated through an adjoining room, the opening to the adjoining room shall be unobstructed and shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 25 square feet (2.3 m²). The minimum openable area to the outdoors shall be based on the total floor area being ventilated.

Exception: Exterior openings required for ventilation shall be permitted to open into a thermally isolated sunroom addition or patio cover provided that the openable area between the sunroom addition or patio cover and the interior room shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 20 square feet (1.86 m²). The minimum openable area to the outdoors shall be based on the total floor area being ventilated.

1203.4.1.2 Openings below grade. Where openings below grade provide required natural ventilation, the outside horizontal clear space measured perpendicular to the opening shall be one and one-half times the depth of

the opening. The depth of the opening shall be measured from the average adjoining ground level to the bottom of the opening.

1203.4.2 Contaminants exhausted. Contaminant sources in naturally ventilated spaces shall be removed in accordance with the *Florida Building Code, Mechanical* and the *Florida Fire Prevention Code*.

1203.4.2.1 Bathrooms. Rooms containing bathtubs, showers, spas and similar bathing fixtures shall be mechanically ventilated in accordance with the *Florida Building Code, Mechanical*.

1203.4.3 Openings on yards or courts. Where natural ventilation is to be provided by openings onto yards or courts, such yards or courts shall comply with Section 1206.

1203.5 Other ventilation and exhaust systems. Ventilation and exhaust systems for occupancies and operations involving flammable or combustible hazards or other contaminant sources as covered in the *Florida Building Code, Mechanical* or the *Florida Fire Prevention Code* shall be provided as required by both codes.

SECTION 1204 TEMPERATURE CONTROL

1204.1 Equipment and systems. Interior spaces intended for human occupancy shall be provided with active or passive space-heating systems capable of maintaining a minimum indoor temperature of 68°F (20°C) at a point 3 feet (914 mm) above the floor on the design heating day.

Exception: Interior spaces where the primary purpose is not associated with human comfort.

SECTION 1205 LIGHTING

1205.1 General. Every space intended for human occupancy shall be provided with natural light by means of exterior glazed openings in accordance with Section 1205.2 or shall be provided with artificial light in accordance with Section 1205.3. Exterior glazed openings shall open directly onto a public way or onto a yard or court in accordance with Section 1206.

1205.2 Natural light. The minimum net glazed area shall not be less than 8 percent of the floor area of the room served.

1205.2.1 Adjoining spaces. For the purpose of natural lighting, any room is permitted to be considered as a portion of an adjoining room where one-half of the area of the common wall is open and unobstructed and provides an opening of not less than one-tenth of the floor area of the interior room or 25 square feet (2.32 m²), whichever is greater.

Exception: Openings required for natural light shall be permitted to open into a thermally isolated sunroom addition or patio cover where the common wall provides a glazed area of not less than one-tenth of the floor area of the interior room or 20 square feet (1.86 m²), whichever is greater.

1205.2.2 Exterior openings. Exterior openings required by Section 1205.2 for natural light shall open directly onto a public way, yard or court, as set forth in Section 1206.

Exceptions:

1. Required exterior openings are permitted to open into a roofed porch where the porch:
 - 1.1. Abuts a public way, yard or court.
 - 1.2. Has a ceiling height of not less than 7 feet (2134 mm).
 - 1.3. Has a longer side at least 65 percent open and unobstructed.
2. Skylights are not required to open directly onto a public way, yard or court.

1205.3 Artificial light. Artificial light shall be provided that is adequate to provide an average illumination of 10 foot-candles (107 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.

1205.4 Stairway illumination. Stairways within dwelling units and exterior stairways serving a dwelling unit shall have an illumination level on tread runs of not less than 1 foot-candle (11 lux). Stairs in other occupancies shall be governed by Chapter 10.

1205.4.1 Controls. The control for activation of the required stairway lighting shall be in accordance with Chapter 27 of the *Florida Building Code, Building*.

1205.5 Emergency egress lighting. The means of egress shall be illuminated in accordance with Section 1006.1.

**SECTION 1206
YARDS OR COURTS**

1206.1 General. This section shall apply to yards and courts adjacent to exterior openings that provide natural light or ventilation. Such yards and courts shall be on the same property as the building.

1206.2 Yards. Yards shall not be less than 3 feet (914 mm) in width for one- and two-story buildings. For buildings more than two stories in height, the minimum width of the yard shall be increased at the rate of 1 foot (305 mm) for each additional story. For buildings exceeding 14 stories in height, the required width of the yard shall be computed on the basis of 14 stories.

1206.3 Courts. Courts shall not be less than 3 feet (914 mm) in width. Courts having windows opening on opposite sides shall not be less than 6 feet (1829 mm) in width. Courts shall not be less than 10 feet (3048 mm) in length unless bounded on one end by a public way or yard. For buildings more than two stories in height, the court shall be increased 1 foot (305 mm) in width and 2 feet (310 mm) in length for each additional story. For buildings exceeding 14 stories in height, the required dimensions shall be computed on the basis of 14 stories.

1206.3.1 Court access. Access shall be provided to the bottom of courts for cleaning purposes.

1206.3.2 Air intake. Courts more than two stories in height shall be provided with a horizontal air intake at the bottom not less than 10 square feet (0.93 m²) in area and leading to

the exterior of the building unless abutting a yard or public way.

1206.3.3 Court drainage. The bottom of every court shall be properly graded and drained to a public sewer or other approved disposal system complying with the *Florida Building Code, Plumbing*.

**SECTION 1207
SOUND TRANSMISSION**

1207.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent dwelling units or between dwelling units and adjacent public areas such as halls, corridors, stairs or service areas.

1207.2 Air-borne sound. Walls, partitions and floor/ceiling assemblies separating dwelling units from each other or from public or service areas shall have a sound transmission class (STC) of not less than 50 (45 if field tested) for air-borne noise when tested in accordance with ASTM E 90. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to dwelling unit entrance doors; however, such doors shall be tight fitting to the frame and sill.

1207.3 Structure-borne sound. Floor/ceiling assemblies between dwelling units or between a dwelling unit and a public or service area within the structure shall have an impact insulation class (IIC) rating of not less than 50 (45 if field tested) when tested in accordance with ASTM E 492.

**SECTION 1208
INTERIOR SPACE DIMENSIONS**

1208.1 Minimum room widths. Habitable spaces, other than a kitchen, shall not be less than 7 feet (2134 mm) in any plan dimension. Kitchens shall have a clear passageway of not less than 3 feet (914 mm) between counter fronts and appliances or counter fronts and walls.

1208.2 Minimum ceiling heights. Occupiable spaces, habitable spaces and corridors shall have a ceiling height of not less than 7 feet 6 inches (2286 mm). Bathrooms, toilet rooms, kitchens, storage rooms and laundry rooms shall be permitted to have a ceiling height of not less than 7 feet (2134 mm).

Exceptions:

1. In one- and two-family dwellings, beams or girders spaced not less than 4 feet (1219 mm) on center and projecting not more than 6 inches (152 mm) below the required ceiling height.
2. If any room in a building has a sloped ceiling, the prescribed ceiling height for the room is required in one-half the area thereof. Any portion of the room measuring less than 5 feet (1524 mm) from the finished floor to the ceiling shall not be included in any computation of the minimum area thereof. For accessibility provisions related to vertical clearance of

areas adjoining an accessible route, refer to Section 11-4.4.2.

3. Mezzanines constructed in accordance with Section 505.1.

1208.2.1 Furred ceiling. Any room with a furred ceiling shall be required to have the minimum ceiling height in two-thirds of the area thereof, but in no case shall the height of the furred ceiling be less than 7 feet (2134 mm).

1208.3 Room area. Every dwelling unit shall have at least one room that shall have not less than 120 square feet (13.9 m²) of net floor area. Other habitable rooms shall have a net floor area of not less than 70 square feet (6.5 m²).

Exception: Every kitchen in a one- and two-family dwelling shall have not less than 50 square feet (4.64 m²) of gross floor area.

1208.4 Efficiency dwelling units. An efficiency living unit shall conform to the requirements of the code except as modified herein:

1. The unit shall have a living room of not less than 220 square feet (20.4 m²) of floor area. An additional 100 square feet (9.3 m²) of floor area shall be provided for each occupant of such unit in excess of two.
2. The unit shall be provided with a separate closet.
3. The unit shall be provided with a kitchen sink, cooking appliance and refrigeration facilities, each having a clear working space of not less than 30 inches (762 mm) in front. Light and ventilation conforming to this code shall be provided.
4. The unit shall be provided with a separate bathroom containing a water closet, lavatory and bathtub or shower.

1210.2 Walls. Walls within 2 feet (610 mm) of urinals and water closets shall have a smooth, hard, nonabsorbent surface, to a height of 4 feet (1219 mm) above the floor, and except for structural elements, the materials used in such walls shall be of a type that is not adversely affected by moisture.

Exceptions:

1. Dwelling units and sleeping units.
2. Toilet rooms that are not accessible to the public and which have not more than one water closet.

Accessories such as grab bars, towel bars, paper dispensers and soap dishes, provided on or within walls, shall be installed and sealed to protect structural elements from moisture.

1210.3 Showers. Shower compartments and walls above bathtubs with installed shower heads shall be finished with a smooth, nonabsorbent surface to a height not less than 70 inches (1778 mm) above the drain inlet.

1210.4 Waterproof joints. Built-in tubs with showers shall have waterproof joints between the tub and adjacent wall.

1210.5 Toilet rooms. Toilet rooms shall not open directly into a room used for the preparation of food for service to the public.

SECTION 1209

ACCESS TO UNOCCUPIED SPACES

1209.1 Crawl spaces. Crawl spaces shall be provided with a minimum of one access opening not less than 18 inches by 24 inches (457 mm by 610 mm).

1209.2 Attic spaces. An opening not less than 20 inches by 30 inches (559 mm by 762 mm) shall be provided to any attic area having a clear height of over 30 inches (762 mm). A 30-inch (762 mm) minimum clear headroom in the attic space shall be provided at or above the access opening.

1209.3 Mechanical appliances. Access to mechanical appliances installed in under-floor areas, in attic spaces and on roofs or elevated structures shall be in accordance with the *Florida Building Code, Mechanical*.

SECTION 1210

SURROUNDING MATERIALS

1210.1 Floors. In other than dwelling units, toilet and bathing room floors shall have a smooth, hard, nonabsorbent surface that extends upward onto the walls at least 6 inches (152 mm).