



**Department of Commerce**

Division of Industrial Compliance

John R. Kasich, Governor  
David Goodman, Director

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At its meeting on February 8, 2013, the Ohio Board of Building Standards adopted the rule changes identified as Amendments Group 87. These rule amendments were adopted for an **effective date of March 1, 2013.**

Amendments Group 87 included the following amended Ohio Building Code (OBC) rules. For your use, a summary of the changes is provided below and the text of these rules can be found immediately following this coversheet:

Rule Number	OBC Chapter	Chapter Title
4101:1-1-01	1	Administration
4101:1-4-01	4	Special detailed requirements based on use and occupancy
4101:1-9-01	9	Fire protection systems
4101:1-10-01	10	Means of egress
4101:1-11-01	11	Accessibility
4101:1-30-01	30	Elevators and conveying systems
4101:1-31-01	31	Special construction
4101:1-35-01	35	Referenced Standards

**Reason for Amendments:** **4101:1-1-01** to make corrections and delete provisions related to the certification of building departments, department personnel, boards of building appeals, and fire protection designers which are proposed to be relocated to 4101:7; **4101:1-4-01** to correct references within the chapter to the appropriate accessibility standards and to amend provisions related to health care facilities in coordination with the Ohio Department of Aging and the Ohio Department of Health to safely enhance the quality of life for elders; **4101:1-9-01** to correct several references within the chapter to the appropriate fire code and accessibility standards and to clarify a reference to manually activated smoke exhaust systems; **4101:1-10-01** to amend provisions related to health care facilities in coordination with the Ohio Department of Aging and the Ohio Department of Health to safely enhance the quality of life for elders and to readopt language included in Petition 11-01 previously adopted by the board related to F-1 and S-1 exit access travel distances; **4101:1-11-01** to further update provisions of the chapter consistent with the federal accessibility guidelines; **4101:1-30-01** to correct several references within the chapter to the appropriate accessibility standards; **4101:1-31-01** (rescind and adopt new) to clarify language relating to tent approvals, swimming pool gates, manufactured homes, and adds language for refuse containers previously found in 4101:4-88; and **4101:1-35-01** to edit Table 3501.2 to remove the references to the 2007 OPC and the NFPA 70-2008 for residential buildings, to add CPSC standard 16 CFR 1301, to delete the reference to the ICC-IFC, and to edit the title of NFPA standard 72.

If you should have any questions regarding these rule changes, please call BBS staff at (614)644-2613.

**4101:1-1-01 Administration.****Section 101  
General**

**101.1 Title.** Chapters 4101:1-1 to 4101:1-35 of the Administrative Code shall be designated as the “Ohio Building Code” for which the designation “OBC” may be substituted. The “International Building Code 2009, first printing, Chapters 2 to 35,” as published by the “International Code Council, Inc.” is used as the basis of this document and is incorporated fully except as modified herein. References in these chapters to “this code” or to the “building code” in other sections of the Administrative Code shall mean the “Ohio Building Code.”

**101.2 Scope.** The provisions of the “Ohio Building Code”, the “Ohio Mechanical Code”, and the “Ohio Plumbing 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. As provided in division (B) of section 3791.04 of the Revised Code, no plans or specifications shall be approved or inspection approval given unless the building represented by those plans or specifications would, if constructed, repaired, erected, or equipped according to those plans or specifications, comply with Chapters 3781. and 3791. of the Revised Code and any rules adopted by the board. An owner may exceed the requirements of the “Ohio Building Code” in compliance with section 102.9.

**Exceptions:**

1. This code applies to detached one-, two-, and three-family dwellings and structures accessory to those dwellings, only to the extent indicated in section 310 of this code.
2. Buildings owned by and used for a function of the United States government.
3. Buildings or structures which are incident to the use for agricultural purposes of the land on which said buildings or structures are located, provided such buildings or structures are not used in the business of retail trade; for the purposes of this section, a building or structure is not considered used in the business of retail trade if fifty per cent or more of the gross income received from sales of products in the building or structure by the owner or operator is from sales of products produced or raised in a normal crop year on farms

- owned or operated by the seller (see sections 3781.06 and 3781.061 of the Revised Code).*
4. *Agricultural labor camps.*
  5. *Type A or Type B family day-care homes, except for the inspection required for licensure by the “Ohio Department of Jobs and Family Services (ODJFS)”. This required inspection shall be conducted by the certified building department having jurisdiction or the division of industrial compliance and labor in accordance with the inspection checklist found on the board of building standard’s website.*
  6. *Buildings or structures which are designed, constructed, and maintained in accordance with federal standards and regulations and are used primarily for federal and state military purposes where the U.S. secretary of defense, pursuant to 10 U.S.C. Sections 18233(A)(1) and 18237, has acquired by purchase, lease, or transfer, and constructs, expands, rehabilitates, or corrects and equips, such buildings or structures as he determines to be necessary to carry out the purposes of Chapter 1803 of the U.S.C.*
  7. *Manufactured homes constructed under “24 CFR Part 3280,” “Manufactured Home Construction and Safety Standards” and within the scope of the rules adopted by the Ohio Manufactured Home Commission.*
  8. *Sewerage systems, treatment works, and disposal systems (including the tanks, piping, and process equipment associated with these systems) regulated by the legislative authority of a municipal corporation or the governing board of a county or special district owning or operating a publicly owned treatment works or sewerage system as stated in division (A) of section 6111.032 of the Revised Code.*
  9. *Building sewer piping.*
  10. *Portable electric generators and wiring supplying carnival and amusement park rides regulated by the Ohio Department of Agriculture.*
  11. *Structures directly related to the operation of a generating plant or major utility facilities regulated by the power siting board. As a condition of the power siting board’s approval, the building department may be requested to review and inspect these structures for compliance with the rules of the board of building standards. However, the building department has no enforcement*

*authority.*

**101.2.1 Appendices.** *The content of the appendices to the Administrative Code is not adopted material but is approved by the board of building standards (BBS) and provided as a reference for code users.*

**101.3 Intent.** *The purpose of this code is to establish uniform minimum requirements for the erection, construction, repair, alteration, and maintenance of buildings, including construction of industrialized units. Such requirements shall relate to the conservation of energy, safety, and sanitation of buildings for their intended use and occupancy with consideration for the following:*

- 1. Performance.** *Establish such requirements, in terms of performance objectives for the use intended.*
- 2. Extent of use.** *Permit to the fullest extent feasible, the use of materials and technical methods, devices, and improvements which tend to reduce the cost of construction without affecting minimum requirements for the health, safety, and security of the occupants of buildings without preferential treatment of types or classes of materials or products or methods of construction.*
- 3. Standardization.** *To encourage, so far as may be practicable, the standardization of construction practices, methods, equipment, material and techniques, including methods employed to produce industrialized units.*

*The rules of the board and proceedings shall be liberally construed in order to promote its purpose. When the building official finds that the proposed design is a reasonable interpretation of the provisions of this code, it shall be approved. Materials, equipment and devices approved by the building official pursuant to section 114 shall be constructed and installed in accordance with such approval.*

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

**101.4.1 Mechanical.** *Chapters 4101:2-1 to 4101:2-15 of the Administrative Code, designated as the "Ohio Mechanical Code," shall apply to the installation, alterations, repairs, and replacement of mechanical systems, including equipment, appliances, fixtures, fittings and/or appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators, and other energy-related systems.*

**101.4.2 Plumbing.** Chapters 4101:3-1 to 4101:3-13 of the Administrative Code, designated as the “Ohio Plumbing Code,” shall apply to the installation, alterations, repairs and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewerage system and all aspects of a medical gas system.

**101.4.3 Elevator.** The provisions of the “Ohio Elevator Code” (Chapters 4101:5-1 to 4101:5-3 of the Administrative Code) shall apply to the design, construction, repair, alteration and maintenance of elevators and other lifting devices as listed and defined therein.

**101.4.4 Fire prevention.** The provisions of the “Ohio Fire Code” (Chapters 1301:7-1 to 1301:7-7 of the Administrative Code) shall apply to the preventive measures which provide for fire-safe conduct and operations in buildings and includes the maintenance of fire-detection, fire alarm, and fire extinguishing equipment and systems, exit facilities, opening protectives, safety devices, good housekeeping practices and fire drills.

**101.4.5 Boiler.** The provisions of the “Ohio Boiler and Pressure Vessel Rules” (Chapters 4101:4-1 to 4101:4-10 of the Administrative Code) shall apply to the design, construction, repair, alteration and maintenance of boilers and unfired pressure vessels as listed and defined therein.

## **Section 102** **Applicability and Jurisdictional Authority**

**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.

**102.2 Other laws.** The provisions of this code shall not be deemed to nullify any provisions of state or federal law. Municipal corporations may make further and additional regulations, not in conflict with Chapters 3781. and 3791. of the Revised Code or with the rules of the board of building standards. However approval by the board of building standards of any fixture, device, material, system, assembly or product of a manufacturing process, or method or manner of construction or installation shall constitute approval for their use anywhere in Ohio.

**102.3 Other rules.** *As provided in division (B) of section 3781.11 of the Revised Code, the rules of the board of building standards shall supersede and govern any order, standard, or rule of the divisions of the fire marshal or industrial compliance in the department of commerce, and the department of health and of counties and townships, in all cases where such orders, standards or rules are in conflict with the rules of the board of building standards, except that rules adopted and orders issued by the fire marshal pursuant to Chapter 3743. of the Revised Code prevail in the event of a conflict.*

*The rules of the board of building standards adopted pursuant to section 3781.10 of the Revised Code shall govern any rule or standard adopted by the board pursuant to sections 4104.02 and 4105.011 of the Revised Code.*

**102.4 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.*

**102.5 Referenced codes and standards.** *When a reference is made within the building, mechanical, or plumbing codes to a federal statutory provision, an industry consensus standard, or any other technical publication, the specific date and title of the publication as well as the name and address of the promulgating agency are listed in Chapter 35 of the building code, Chapter 15 of the mechanical code, or Chapter 13 of the plumbing code.*

*The codes and standards referenced in the building, mechanical, and plumbing codes shall be considered part of the requirements of these codes as though the text were printed in this code, to the prescribed extent of each such reference. Where differences occur between provisions of these codes and the referenced standards, the provisions of these codes shall apply.*

**102.6 Partial invalidity.** *In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making void or illegal any of the other parts or provisions thereof, and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.*

**102.7 Existing structures.** *The provisions of Chapter 34 shall control the alteration, repair, addition, maintenance, and change of occupancy of any existing structure.*

*The occupancy of any structure currently existing on the date of adoption of this*

*code shall be permitted to continue without change provided there are no orders of the building official pending, no evidence of fraud, or no serious safety or sanitation hazard. When requested, such approvals shall be in the form of a "Certificate of Occupancy for an Existing Building" in accordance with section 111.2.*

*Buildings constructed in accordance with plans which have been approved prior to the effective date of this code are existing buildings.*

**102.8 Temporary Structures.** *The building official is authorized to issue approvals for temporary structures. Such approvals shall be in the form of a "Certificate of Occupancy for a Temporary Building" in accordance with section 111.1.6. This section does not apply to time-limited occupancies in existing structures. See section 111.1.5 for time-limited occupancies.*

**102.8.1 Conformance.** *Temporary structures shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare. Temporary tents and membrane structures shall also comply with the applicable provisions in section ~~3102~~ 3103.*

**102.8.2 Termination of approval.** *The building official is authorized to terminate approval for a temporary structure and to order the temporary structure to be discontinued if conditions of the approval have been violated or the structure or occupancy poses an immediate hazard to the public or occupants of the structure.*

**102.9 Non-required work.** *Any component, building element, equipment, system or portion thereof not required by this code shall be permitted to be installed as a partial or complete system provided that it is constructed or installed in accordance with this code to the extent of the installation.*

**102.10 Work exempt from approval.** *Approval shall not be required for the following:*

***Building:***

- 1. One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed one hundred twenty square feet (11.15 m<sup>2</sup>) and playground structures.*
- 2. Fences not over six feet (1829 mm) high.*

3. *Oil derricks.*
4. *Retaining walls which are not over four feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II or III-A liquids.*
5. *Water tanks supported directly upon grade if the capacity does not exceed five thousand gallons (18 927 L) and the ratio of height to diameter or width does not exceed two to one.*
6. *Sidewalks and driveways not more than thirty inches (762 mm) above grade and not over any basement or story below and which are not part of an accessible route.*
7. *Finishes not regulated by this code, decorating, or other work defined as maintenance or minor repair.*
8. *Temporary motion picture, television and theater stage sets and scenery.*
9. *Window awnings supported by an exterior wall of Group R-3.*
10. *Tents and membrane structures exempted in section 3102.1.1.*

***Electrical:***

1. *Minor repair work, including the replacement of lamps or the connection of approved portable electrical equipment to approved permanently installed receptacles.*
2. *Electrical equipment used for radio and television transmissions except equipment and wiring for power supply, and the installations of towers and antennas.*
3. *The installation of any temporary system required for the testing or servicing of electrical equipment or apparatus.*
4. *Electrical wiring, devices, appliances, apparatus or equipment operating at less than twenty-five volts and not capable of supplying more than fifty watts of energy, unless specifically addressed in this code.*

5. *Process equipment and the associated wiring on the load side of the power disconnect to the equipment.*

**Gas:**

1. *Portable heating appliances;*
2. *Replacement of any part that does not alter approval of equipment or make such equipment unsafe.*
3. *Gas distribution piping owned and maintained by public or municipal utilities and located upstream of the point of delivery.*

**Mechanical:**

1. *Portable heating appliances;*
2. *Portable ventilation equipment;*
3. *Portable cooling units;*
4. *Replacement of any part which does not alter its approval or make it unsafe;*
5. *Portable evaporative cooler;*
6. *Process equipment and the associated piping. For combination building services/process or power piping systems, the power or process piping located downstream of the control valve which separates the process from the building services piping is exempt from approval.*
7. *Heating and cooling distribution piping installed and maintained by public or municipal utilities.*

**Plumbing:**

1. *The repair 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 an approval shall be obtained and inspection made as provided in this code.*

- 2. The clearance of stoppages or the repair 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.*
- 3. Process equipment and the associated piping. For combination building services/process or power piping systems, the power or process piping located downstream of the control valve which separates the process from the building services piping is exempt from approval.*

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

**102.10.2 Minor repairs.** *Minor repairs to structures may be made without application or notice to the building official. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load bearing support, or the removal or change of any required means of egress, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include addition to, alteration of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.*

**102.11 Building department jurisdictional limitations.** *A municipal, township, or county building department that has been certified by the board of building standards, pursuant to section 103.2, shall enforce provisions of the rules of the board and of Chapters 3781. and 3791. of the Revised Code, relating to construction, arrangement, and the erection of buildings or parts thereof as defined in the rules of the board in accordance with the certification except as follows:*

- 1. **Fire.** The state fire marshal or fire chief of municipal corporations or townships, having fire departments, shall enforce all provisions of the rules of the board relating to fire prevention.*

2. **Health.** *The department of health, or the boards of health of city or general health districts, the division of industrial compliance of the department of commerce, or the departments of building inspection of municipal corporations, townships, or counties shall enforce such provisions relating to sanitary construction.*
3. **Sewerage and drainage system.** *In accordance with Section 3781.03 of the Revised Code, the department of the city engineer, in cities having such departments, the boards of health of health districts, or the sewer purveyor, as appropriate, shall have complete supervision and regulation of the entire sewerage and drainage system of the jurisdiction, including the building sewer and all laterals draining into the street sewers. Such department or agency shall have control and supervision of the installation and construction of all drains and sewers that become a part of the sewerage system of the jurisdiction and shall issue all the necessary permits and licenses for the construction and installation of all building sewers and of all other lateral drains that empty into the main sewers. Such department or agency shall keep a permanent record of the installation and location of every drain and sewerage system of the city.*
4. **Power Generation.** *Structures directly related to the operation of a generating plant or major utility facilities regulated by the power siting board. As a condition of the power siting board's approval, the building department may be requested to review and inspect these structures for compliance with the rules of the board of building standards. However, the building department has no enforcement authority.*
5. **State Projects.** *Certification does not confer any jurisdiction to a certified building department to regulate:*
  - 5.1 *The construction of buildings by the state of Ohio or on land owned by the state of Ohio including, but is not limited to, its agencies, authorities, boards, commissions, administrative departments, instrumentalities, community or technical college districts, but does not include other political subdivisions.*

**Exception:** *Local school district building projects funded by the Ohio school facilities commission in accordance with Chapter 3318. of the Revised Code where the local certified building department is authorized by the board to regulate construction of school facilities.*

5.2 *Park districts created pursuant to Chapter 1545. of the Revised Code.*

5.3 *The construction of buildings or structures within the scope of the building code on the premises of, and directly related to the operation of, natural gas liquids fractionation or natural gas processing facilities.*

*Note: The lands owned by Miami university in the city of Oxford and Oxford township in Butler County and leased to private individuals or corporations under the land rent provisions of the Act of February 17, 1809, as set forth at 7 Ohio laws 184, are subject to local certified building department jurisdiction and are exempt from these provisions.*

### **Section 103**

#### ***Certified building departments, personnel, and appeals boards***

~~**103.1 General.** Before exercising authority in the enforcement of the rules of the Board and before accepting and approving plans, municipal, township and county building departments and their required personnel shall be certified by the board of building standards as required in section 3781.10 of the Revised Code. Before hearing and deciding adjudication hearings, local board of appeals shall be certified by the board of building standards as required in section 3781.20 of the Revised Code.~~

~~Applications submitted to the board of building standards for certifications shall be made on prescribed forms according to the provisions of this section.~~

~~**103.2 Building department certification.** Municipalities, townships, and counties may seek certification by the board of building standards as described in division (E) of section 3781.10 of the Revised Code to exercise enforcement authority, to accept and approve construction documents, and to make inspections.~~

~~**103.2.1 Certification types.** A political subdivision may seek to enforce the rules of the board by requesting either a certification as a building department or a sub-building department as required in sections 103.2.1.1 or 103.2.1.2. References in this chapter to “department” or “building department”, unless specified, shall mean “certified building department” or “certified sub-building department.”~~

~~**103.2.1.1 — Certification as a building department.** Municipalities, townships, and counties shall enforce the rules of the board in conformity with the law and as described in sections 103.2.1.1.1 and 103.2.1.1.2.~~

~~**103.2.1.1.1 — Municipalities.** Municipalities, in submitting the application described in section 103.2.3, must specify whether the department is to be certified to enforce the rules of the board for plumbing and will employ a certified plumbing inspector as required in section 103.3. If a department is not to be certified for plumbing, the enforcement shall be done by the local board of health or the division of industrial compliance plumbing section in the department of commerce.~~

~~Municipalities, in submitting the application described in section 103.2.3, must also specify whether the department is to be certified to enforce medical gas piping system provisions and will employ a certified medical gas piping inspector as required in section 103.3. If the department is not to be certified to enforce medical gas piping system provisions, then the enforcement shall be done by the local board of health or the division of industrial compliance in the department of commerce.~~

~~Municipalities may, at any time, make application to the board of building standards to be approved to have the building department certification modified or to include or exclude plumbing and medical gas piping system enforcement duties in accordance with section 103.2.8.~~

~~**103.2.1.1.2 Counties and townships.** Counties and townships, in submitting the application described in section 103.2.3 for certification of a building department, are not certified to enforce plumbing provisions or employ plumbing inspectors required in section 103.3. As permitted in section 3703.01 of the Revised Code, county building departments may enforce plumbing provisions if the county board of health has entered into an agreement with the board of county commissioners to provide plumbing code enforcement and employs a plumbing inspector certified as required in division (D) of section 3703.01 of the Revised Code. The county shall specify on its application whether the county department will enforce the rules of the board for plumbing and will employ a properly certified plumbing inspector. If, after certification, a county building department assumes~~

~~plumbing code enforcement as required in section 3703.01 of the Revised Code, it shall notify the board.~~

~~Counties and townships, in submitting the application described in section 103.2.3, must also specify whether the jurisdiction desires the department to be certified to enforce medical gas piping system provisions and will employ a certified medical gas piping inspector as required in section 103.3. If the county or township chooses not have its department certified to enforce medical gas piping system provisions, then the enforcement shall be done by the local board of health or the division of industrial compliance in the department of commerce.~~

~~Counties and townships may, at any time, make application to the board of building standards to be approved to have the building department certification modified or to include or exclude medical gas piping system enforcement duties in accordance with section 103.2.8.~~

**~~103.2.1.2 Certification as a sub-building department.~~** ~~Municipalities, townships, and counties may be certified by the board of building standards to enforce the rules of the board as a sub-building department in conformity with the law and as described in sections 103.2.1.2.1 and 103.2.1.2.2. A sub-building department has enforcement exercised on their behalf by another certified political subdivision that will perform all enforcement, reporting, and administrative duties.~~

**~~103.2.1.2.1 Municipalities.~~** ~~Municipalities, in submitting the application described in section 103.2.3, must specify whether the department is to be certified as a sub-building department and shall indicate which certified building department of another political subdivision will enforce the rules of the board in the municipality. The application must also specify how the public in a municipality with a building department certified sub-building department will be provided information on how construction documents will be accepted, reviewed, and approved, and how inspections will be requested and made.~~

~~Municipalities may, at any time, make application to the board of building standards to be approved to have the building department certification modified to change its certification from a sub-building department to a certified building department, or vice versa, in accordance with section 103.2.8.1.~~

~~**103.2.1.2.2 Counties and townships.** Counties and townships, in submitting the application described in section 103.2.3, must specify whether the department is to be certified as a sub-building department and shall indicate which certified building department of another political subdivision will enforce the rules of the board in the county or township. The county or township must also specify how the public in the county or township with a building department certified as a sub-building department will be provided information on how construction documents will be accepted and approved, and how inspections will be requested and made.~~

~~Counties and townships may, at any time, make application to the board of building standards to be approved to have the building department certification modified to change its certification from a sub-building department and to a certified building department, or vice versa, in accordance with section 103.2.8.1.~~

~~**103.2.2 Building department certification requirements.** To qualify for certification, a municipal, township, or county shall comply with the following:~~

- ~~1. **Conformity with law.** The department shall submit an application and shall have been created in conformity with the law, shall have adopted ordinances or resolutions, and shall have entered into any agreements or contracts necessary to comply with the rules of the board and section 103.2.3;~~
- ~~2. **Required personnel.** A certified building department or sub-building department shall have the following personnel qualified to execute the duties required for the exercise of enforcement authority, the review and approval of construction documents, and the performance of inspections under the rules of the board. All personnel of municipal, township, or county building departments, and persons and employees of persons, firms, or corporations whose responsibilities include the exercise of enforcement authority shall be certified by the board of building standards pursuant to section 103.3 prior to performing such duties;~~
  - ~~2.1 **Building official.** The building department shall have in its employ or under contract one person appointed by the municipality, township, or county certified as a building official.~~

- ~~2.2 **Masters plans examiner.** The building department shall have in its employ or under contract at least one person holding a certification as the master plans examiner.~~
- ~~2.3 **Building inspector.** The building department shall have in its employ or under contract at least one person holding a certification as a building inspector.~~
- ~~2.4 **Plumbing inspector.** If the department is certified to enforce plumbing provisions, then the building department shall have in its employ or under contract at least one person holding a certification as a plumbing inspector.~~
- ~~2.5 **Electrical safety inspector.** The building department shall have in its employ or under contract at least one person holding an electrical safety inspector certification.~~
- ~~2.6 **Backup personnel.** The department shall have in its employ or under contract, alternate personnel meeting the requirements of this rule, to serve in the event of a conflict of interest or the unavailability of the building official, plans examiner or inspectors.~~
- ~~2.7 **Replacement personnel.** When required personnel leave the employ of the department, permanent replacement personnel shall be designated in accordance with the rules of the Board within one hundred twenty days.~~
- ~~3. **Elective personnel.** The department may elect to have the following personnel certified by the board of building standards pursuant to section 103.3 prior to performing such duties;~~
- ~~3.1 **Mechanical inspector.** The department may also have in its employ or under contract persons holding a mechanical inspector certification.~~
- ~~3.2 **Fire protection inspector.** The department may also have in its employ or under contract persons holding a fire protection inspector certification.~~
- ~~3.3 **Medical gas piping inspector.** The department may have in its employ or under contract persons holding a medical gas piping inspector~~

~~certification.~~

~~3.4 **Electrical plans examiner.** The department may have in its employ or under contract persons holding an electrical plans examiner certification.~~

~~3.5 **Plumbing plans examiner.** The department may have in its employ or under contract persons holding a plumbing plans examiner certification.~~

~~4. **Contract employees.** A municipal corporation, township, or county may contract with a certified building department, health district, or with persons, firms, or corporations under contract to furnish services, and meeting the requirements of this rule, to exercise enforcement authority, administer these rules, approve plans and specifications and perform inspections on behalf of such municipal corporation, township, or county, providing such authority is exercised pursuant to such contract and upon application to and approval by the board of building standards;~~

~~5. **Building department office.** The certified building department shall have an office conveniently located within the area it serves. The office shall be open and staffed to serve the public need and office hours shall be conspicuously posted. If the department contracts for its enforcement services, or is certified as a sub-building department, information shall be provided to the public explaining how building department services shall be provided;~~

~~6. **Availability of inspectors.** The building department shall be staffed so that all inspectors are available for requested inspections as required in section 108.1; and~~

~~7. **Building department certification, to be posted.** The certificate issued by the board of building standards to a municipal, township, or county building department shall be posted in a conspicuous place within the jurisdiction.~~

~~103.2.3 **Building department certification application.** Application for certification of a municipal, township, or county building department, or application for modification of an existing certification, shall be made on a form prescribed by the board of building standards and shall set forth:~~

- ~~1. Copy of the law creating such a department.~~
- ~~2. Copy of a resolution requesting certification of the building department to enforce the rules of the board.~~
- ~~3. The proposed budget for the operation of such department.~~
- ~~4. A chart showing the organization of the building department within the governmental body.~~
- ~~5. Data reflecting the population and the size of the area to be served.~~
- ~~6. The number of and board certifications held by staff to be employed by the building department.~~
- ~~7. The names, addresses, and board certifications of persons, firms or corporations contracting to furnish work or services when such persons, firms, or corporations are under contract to furnish architectural, engineering, or inspection services to the municipal corporation, township, or county, and such authority is exercised pursuant to such contract.~~
- ~~8. The names of other municipal corporations, townships, counties, or health districts contracting to furnish work or services when such other municipal corporation, township, county, or health district is under contract to furnish architectural or engineering services to the municipal corporation, township, or county, and such authority is exercised pursuant to such contract and when officers or employees of any other municipal corporation, township, county, or health district under contract to furnish inspection services to the municipal corporation, township, or county, when such authority is exercised pursuant to such contract.~~
- ~~9. A copy of the ordinance or resolution authorizing a building department to enter into a contract with other municipalities, townships, counties, health districts, persons, firms or corporations to do their plan approval and inspections.~~
- ~~10. A copy of the contract between the building department and other municipalities, townships, counties, health districts, persons, firms, or corporations to do their plan approval or inspections.~~

- ~~11. The department within the municipality, township, or county which will be responsible for plumbing inspection, if not within the building department.~~
- ~~12. The applicant may attach any other charts, maps, statistical data or other information which it determines may be beneficial to the board in considering the applications for certification.~~
- ~~13. A procedure for plan approval and for performing inspections, a copy of the plan review application, and a copy of the department's approval stamp.~~
- ~~14. The board may allow amendments to applications prior to formal action. Requests for amendments to applications shall be made in writing and conform to all the other provisions of this rule.~~
- ~~15. The original of the documents, papers and charts required in items one to sixteen of this section shall be filed with the board at least two weeks prior to a certification hearing.~~
- ~~16. Signature of an authorized representative of the board of township trustees in townships, the board of county commissioners in counties, or the appropriate officials in municipalities.~~

~~The board shall hold a hearing to take action on the application. The applicant may be present at the hearing to respond to any questions from the board and all interested persons appearing at such hearing may be given an opportunity to comment.~~

~~**103.2.4 Building department certification, certification hearing.** Upon receipt of an application, the board of building standard's certification committee shall review the application and make a recommendation to the board of building standards. The committee may ask for additional information to be submitted by the applicant prior to making a recommendation to the board. If the committee requests additional information from the applicant, failure to submit the requested information within ninety days from the date of the request may be cause for disapproval of the application by the board. After receiving a recommendation from the committee, a certification hearing on the application shall be conducted by the board of building standards. An authorized representative of the municipality, township, or county seeking certification present at the certification hearing may give testimony or respond to any questions from the~~

~~board. The board shall give all interested persons appearing at such certification hearing an opportunity to be heard and explain their positions. A record of the proceeding shall be made by the board.~~

~~**103.2.4.1 — Building department certification, approval or denial.** Following the certification hearing, the board shall act on the application for certification.~~

~~Approval by the board of building standards of an application for certification shall set forth the group classifications and subject matters for which the municipal, township, or county building department under consideration is to be certified. After such approval, the appropriate official in municipalities, the board of township trustees in townships, or the board of county commissioners in counties requesting certification, shall be furnished a certificate of approval which shall state the conditions and limitations, if any, under which it has been issued.~~

~~If the application is denied in whole or in part by the board of building standards, the appropriate official in municipalities, the board of township trustees in townships, or the board of county commissioners in counties requesting certification shall be notified in writing of such denial and the reason therefore and to their rights of appeal pursuant to sections 3781.10, 3781.101, and Chapter 119. of the Revised Code.~~

~~**103.2.5 Building department certification, board to maintain list.** The board of building standards shall maintain a current list of all certified nonresidential and residential building departments, their contact information and, if applicable, their contractual relationships with other persons, departments, firms, or corporations that enforce the rules of the board on behalf of the certified building department.~~

~~The list of certified building departments shall be made available upon request and shall be posted on the board's website at <http://www.com.ohio.gov/dico/BBS.aspx>.~~

~~**103.2.6 — Building department certification, reports, and assessment.** Certified building departments shall submit the following reports and information to the board of building standards:~~

- ~~1. A yearly operational report for the previous year, within ninety calendar days after the end of each calendar year;~~

- ~~2. Written notification of changes in personnel of the building department who enforce the rules of the board, within thirty calendar days after such personnel have been appointed;~~
- ~~3. Replies to any special requests or queries made by the board of building standards, within thirty calendar days of receipt;~~
- ~~4. Copies of revised contracts or agreements, within thirty calendar days after the department creates or changes a contractual relationship with another department or firm.~~

~~**103.2.6.1 — Board assessment** Each political subdivision that prescribes fees pursuant to division (E) of section 3781.102 of the Revised Code shall also collect on behalf of the board of building standards an assessment equal to three per cent of those fees imposed for approvals, the acceptance and approval of plans and specifications, and for performing inspections.~~

~~**103.2.6.1.1 — Assessment report.** The building official shall report on the prescribed form and remit monthly by check, the amount of the assessments collected on behalf of the board not later than sixty days following the end of each month in which the assessments are collected. In the case of building departments under contract to exercise enforcement authority pursuant to section 103.2.1.2, the building official shall report and remit to the Board for all certified sub-building departments. The check shall be made payable to the "Treasurer, State of Ohio".~~

~~**103.2.7 — Building department certification, revocation or suspension.** Upon petition to the board of building standards by any person affected by the exercise of the authority granted under such certification, or by the board on its own motion, in accordance with division (E) of section 3781.10 of the Revised Code, a department certification may be revoked or suspended with respect to any and all of the group classifications for which it is certified.~~

~~**103.2.7.1 — Building department certification, hearings and appeals.** Hearings shall be held by the board of building standards and appeals shall be permitted on any proceedings for certification as provided in section 119.07 of the Revised Code and in sections 103.2.7.1.1, 103.3.10.2, and 103.4.4.2.~~

~~103.2.7.1.1~~ **Complaint process.** ~~Upon receipt of a written complaint against a certified building department that is substantiated by demonstrable evidence or upon the board's own motion:~~

- ~~1. The board shall decide whether the information submitted warrants causing a formal investigation to be initiated or sending a notice of opportunity for hearing as outlined in item 4 below;~~
- ~~2. If a formal investigation is warranted, the certified jurisdiction shall be notified that an investigation has been initiated by the board;~~
- ~~3. Upon completion of the investigation, findings shall be reported to the board.~~
- ~~4. The board may dismiss the complaint, table the matter for future action, or initiate action to suspend or revoke the certification. If the board issues an order to suspend or revoke the certification it shall:
  - ~~4.1 Notify the certified jurisdiction of the charges by certified mail, return receipt requested. The certified jurisdiction shall be informed that a hearing, if desired, must be requested within thirty days from the date of the mailing to request a hearing before the board. The order shall inform the certified jurisdiction that it may be represented by counsel at the hearing. Failure by the certified jurisdiction to request a hearing within thirty days from the date of the mailing of the notification may cause the board, after a hearing, to uphold the order revoking or suspending certification;~~
  - ~~4.2 Schedule a hearing to be held seven to fifteen days after receipt of the request. The board may continue or postpone the hearing upon application by the party or upon its own motion;~~
  - ~~4.3 The board may appoint a hearing officer to conduct a hearing.~~
  - ~~4.4 A hearing will be conducted during which parties and witnesses can be examined and offer testimony, in a manner~~~~

~~that prevents unnecessary delay, and that ensures the development of a clear and adequate record.~~

~~4.4.1. The hearing shall be conducted pursuant to the provisions of sections 3781.10, 3781.101, and 119.09 of the Revised Code;~~

~~4.5 If a hearing officer has been appointed, then within thirty days after the hearing, the hearing officer shall submit a written report of the findings of fact and recommendations to the board for its consideration.~~

~~5. Following the hearing, the party affected shall be sent a certified copy of the board's action and informed by certified mail, return receipt requested, that the jurisdiction may appeal the order within fifteen days to the court of common pleas in Franklin county pursuant to sections 3781.10, 3781.101, and 119.12 of the Revised Code.~~

~~**103.2.7.2 — Revocation or suspension.** In the event of suspension or revocation of a building department certification, the jurisdiction shall, within fifteen days of being notified of such suspension or revocation, surrender to the secretary of the board of building standards the certificate previously issued under section 103.2.4. The department, upon suspension or revocation, shall no longer hold out to the public that it is authorized to issue certificates of plan approval for the construction, repair, alteration of buildings or classes of buildings specified in section 3781.06 of the Revised Code or for performing inspections for which it has been suspended or certification revoked.~~

~~**103.2.7.2.1 — Outstanding plans review, approvals, inspections, or orders.** In the event of the suspension or revocation of a building department certification, the enforcement duties shall be transferred to the division of industrial compliance or to the certified building department as approved by the board.~~

~~**103.2.7.3 Probationary status.** In the event of an investigation in which the board decides not to immediately suspend or revoke a building department's certification, as outlined in section 103.2.7.2, the board may place the department on probationary status for a period of time and require remedial action as the board deems appropriate. During this time~~

~~the department shall comply with the training, reporting, auditing, or other remedial action required by the board. The board is authorized to revoke or suspend the department's certification for failure to comply with such remedial requirements pursuant to section 103.2.7.2.~~

**~~103.2.8 — Special building department requirements.~~**

~~**103.2.8.1 — Changes in jurisdictional authority.** The department shall submit an application to have its existing building department certification modified. The application shall also include a transition plan identifying all outstanding projects that have received a certificate of plans approval but have yet to be issued a certificate of occupancy. The transition plan shall indicate how and by whom code enforcement duties for those projects will be continued and completed and how paid and pending fees will be assessed and/or shared to prevent duplicative fees and/or enforcement duties.~~

~~**103.2.8.2 — Surrender of department certification.** The political subdivision shall submit a written notification to the board declaring its intention to surrender its existing building department certification. The notification shall also include a transition plan identifying all outstanding projects that have received a certificate of plans approval but have yet to be issued a certificate of occupancy. The transition plan shall indicate how and by whom code enforcement duties for those projects will be continued and completed and how paid and pending fees will be assessed and/or shared to prevent duplicative fees and/or enforcement duties. All documents, reports, and project files will be transferred to the jurisdiction that will assume enforcement authority.~~

~~**103.2.8.2.1 — Township certification when a county is or becomes certified.** A township may not submit an application pursuant section 103.2 to exercise enforcement authority, to accept and approve construction documents, and to make inspections that is located in a county that is already certified. If a township is certified and the county subsequently is certified by the board, the township's certification is preempted by the county one year after the county certification is effective or at an earlier date as the board of township trustees approves. Townships and counties certified by the board as of the effective date of this rule are not affected by this section.~~

~~**103.2.8.3 Structures with shared jurisdictional authority.** When a department receives an application for plan approval for a structure or portion of a structure which, when built, would involve shared jurisdictional authority, the building official shall immediately notify the owner that the structure involves shared jurisdictional authority and the process, determined below, that will be used in approvals and inspections for the project and shall:~~

- ~~1. Determine which other political subdivision(s) has jurisdiction for a portion of the structure;~~
- ~~2. Determine the name and contact information for the building official for any other political subdivision(s) which has jurisdiction for a portion of the structure;~~
- ~~3. Determine, with the advice of legal counsel, and after discussion with the building official(s) of the other political subdivision(s) identified above, how and by whom code enforcement duties for the project shall be completed;~~
- ~~4. Determine how, when, and which enforcement records shall be provided to the various parties;~~
- ~~5. Determine how paid and pending fees will be assessed and/or shared to prevent duplicative fees and/or enforcement duties; and~~
- ~~6. Establish by whom, when, and to whom the certificate of occupancy shall be issued and distributed.~~

~~**103.3 Building department personnel certification.** The department shall have personnel qualified to execute the duties required to enforce the rules of the board. Only those certified individuals employed by or under contract with a particular political subdivision are authorized to exercise enforcement authority within that same jurisdiction.~~

~~**Exception:** Inspectors performing industrialized unit inspections on behalf of the board of building standards.~~

~~**103.3.1 Non-residential building department personnel certification classifications.** The certifications issued by the board of building standards are as follows:~~

- ~~1. Building official.~~
- ~~2. Master plans examiner.~~

~~2.1 Master plans examiner trainee.~~

~~2.2 Electrical plans examiner.~~

~~2.3 Plumbing plans examiner.~~

~~3. Building inspector.~~

~~3.1 Building inspector trainee.~~

~~4. Fire protection inspector~~

~~5. Mechanical inspector.~~

~~5.1 Mechanical inspector trainee.~~

~~6. Electrical safety inspector.~~

~~6.1 Electrical safety inspector trainee.~~

~~7. Non-residential industrialized unit inspector.~~

~~8. Plumbing inspector.~~

~~8.1 Plumbing inspector trainee.~~

~~9. Medical gas piping inspector.~~

~~**103.3.2 Multiple personnel certifications held.** A person may hold more than one certification.~~

~~**103.3.3 Conflict of interest.** No certified employee or person who contracts for services within the jurisdictional area of a department shall perform services for the department which would require that person or employee to exercise authority or make an evaluation of any work furnished by him or by a private contractor that employs him on a full time, part time, or incidental basis. Further, such employee or person shall not engage in conduct that is prohibited or considered a conflict of interest pursuant to Chapter 102. of the Revised Code.~~

~~**103.3.4 Seals.** No holder of a certification issued by the board of building~~

~~standards is authorized to secure a seal in any form or of any type for use in the performance of any of their duties.~~

**~~103.3.5 — Experience requirements of the applicant.~~**

~~1. Only experience directly related to buildings or structures within the scope of groups regulated by the “OBC” shall be acceptable for any certification.~~

~~2. In addition to the experience described in item 1 above, enforcement, inspection, or plans examination experience performed in compliance with any of the following shall also be acceptable for certification:~~

~~2.1 Prior to 1984, for a building department certified by the board of building standards to exercise enforcement authority for buildings or structures within the scope of groups regulated by the rules of the board; or~~

~~2.2 For an agency or jurisdiction outside the state of Ohio enforcing a model building code of a national model code organization or a code adopted for non-residential buildings or structures within the scope of groups regulated by the rules of the board; or~~

~~2.3 An employee of a certified non-residential building department who is a holder of a board certification other than that for which application is being made. — Certified non-residential building department employees who are applicants for plumbing inspector certification and do not comply with section 103.3.5.4 shall enter the plumbing inspector trainee program; or~~

~~2.4 Certification by the department of Commerce, division of industrial compliance, as a plumbing inspector when application is made for board certification as a plumbing inspector; or~~

~~2.5 In evaluating experience of an applicant, the board of building standards shall not credit experience gained while acting in violation of rules adopted by the board to establish equivalent experience. The board of building standards may credit experience which provides knowledge of different construction methods, processes, or types as it determines applicable, but shall not credit construction experience that does not provide required knowledge including, but not limited to,~~

~~the installation of floor and wall coverings, the installation of roofing materials or roofing systems, or the finishing of concrete.~~

- ~~3. For a building, mechanical, or plumbing inspector applicant, one year of the required experience may be obtained through education credit pursuant to section 103.3.12.6.~~

~~**103.3.5.1 — Building official.** An applicant for a building official certification shall meet one of the following requirements:~~

- ~~1. At least five years experience in non-residential building design and construction for buildings or structures within the scope of groups regulated by the rules of the board or experience as specified in section 103.3.5(2) and an Ohio registration as an architect or professional engineer; or~~
- ~~2. At least ten years experience as a construction contractor or superintendent of building construction for buildings or structures dealing with all phases and trades of construction including the responsibility for obtaining approvals and inspections within the scope of groups regulated by the rules of the board or experience as specified in section 103.3.5(2).~~

~~**103.3.5.2 — Master plans examiner.** An applicant for a master plans examiner certification shall meet one of the following requirements:~~

- ~~1. At least five years experience in building design and construction for buildings or structures within the scope of groups regulated by the rules of the board or experience in plan review, as specified in section 103.3.5(2), and an Ohio registration as an architect or professional engineer; or~~
- ~~2. Successful completion of a trainee program pursuant to section 103.3.12.~~

~~**103.3.5.3 — Electrical plans examiner.** An applicant for an electrical plans examiner certification shall meet the following requirement:~~

- ~~1. At least five years experience as a full-time electrical safety inspector in a certified building department.~~

~~**103.3.5.4 — Plumbing plans examiner.** An applicant for a plumbing plans examiner certification shall meet one of the following requirements:~~

- ~~1. At least five years experience as a full-time plumbing inspector in a certified building department; or~~
- ~~2. At least five years experience as a plumbing inspector, certified pursuant to Chapter 3783. of the Revised Code, employed full-time by either the Ohio department of commerce, division of industrial compliance, or by a county board of health.~~

~~**103.3.5.5 — Building inspector.** An applicant for a building inspector certification shall meet one of the following requirements:~~

- ~~1. At least three years experience as a construction contractor or supervisor for non-residential buildings or structures within the scope of groups regulated by the rules of the board; or~~
- ~~2. At least three years experience as a skilled tradesman for work subject to inspection under a model building code of a national model code organization or a code adopted for non-residential buildings or structures within the scope of groups regulated by the rules of the board, or experience as specified in section 103.3.5(2); or equivalent experience that provided knowledge as determined by the board of building standards. The experience must provide knowledge of different construction methods, processes and types; or~~
- ~~3. Successful completion of a trainee program pursuant to section 103.3.12.~~

~~**103.3.5.6 — Fire protection inspector.** An applicant for fire protection inspector certification shall meet one of the following requirements:~~

- ~~1. At least three years experience in the installation of fire protection systems (automatic sprinkler systems, alternative automatic fire-extinguishing systems, standpipe systems, fire alarm and detection systems and fire pump systems) subject to inspection under a model building code of a national model code organization or a code adopted for non-residential buildings or structures within the scope of groups regulated by the rules of the board; or~~

- ~~2. At least three years experience as specified in section 103.3.5(2) or as a certified fire safety inspector (a maximum of two years experience as a certified automatic sprinkler system designer may be substituted for two of the three years of inspection experience).~~

~~**103.3.5.7 — Mechanical inspector.** An applicant for a mechanical inspector certification shall meet one of the following requirements:~~

- ~~1. At least three years as a skilled HVAC system and associated refrigeration, fuel gas, and heating piping tradesman for work subject to inspection under a model building code of a national model code organization or a code adopted for non residential buildings or structures within the scope of groups regulated by the rules of the board or experience as specified in section 103.3.5(2); or~~
- ~~2. Successful completion of a trainee program pursuant to section 103.3.12.~~

~~**103.3.5.8 — Plumbing inspector.** An applicant for a plumbing inspector certification shall meet one of the following requirements:~~

- ~~1. At least seven years experience in the installation of plumbing, subject to inspection under either a model building code of a national model code organization or a code adopted for non residential buildings or structures and within the scope of groups regulated by the rules of the board or experience as specified in section 103.3.5(2); or~~
- ~~2. A degree in engineering or architecture and three years experience in plumbing system design; or~~
- ~~3. Successful completion of a trainee program pursuant to section 103.3.12.~~

~~**103.3.5.9 — Electrical safety inspector.** An applicant for an electrical safety inspector “(ESI)” certification shall meet one of the following requirements:~~

- ~~1. Journeyman electrician or equivalent for four years, two years as an electrician foreman, and two years experience as a building department “ESI” trainee;~~

- ~~2. Journeyman electrician or equivalent for four years and three years experience as a building department “ESI” trainee;~~
- ~~3. Four years experience as a building department “ESI” trainee;~~
- ~~4. Journeyman electrician or equivalent for six years; or~~
- ~~5. An electrical engineer registered in the state of Ohio;~~

~~**103.3.5.10** — **Non-residential industrialized unit inspector.** An applicant for a non-residential industrialized unit inspector certification shall meet one of the following requirements:~~

- ~~1. At least three years experience as a construction contractor or supervisor for non-residential buildings or structures within the scope of groups regulated by the rules of the board, or~~
- ~~2. At least three years experience as a skilled tradesman for work subject to inspection under a model building code of a national model code organization or a code adopted for non-residential buildings or structures within the scope of groups regulated by the rules of the board, or experience as specified in section 103.3.5(2); or equivalent experience that provided knowledge as determined by the board of building standards. The experience must provide knowledge of different construction methods, processes and types; or~~
- ~~3. At least three years experience as a skilled tradesman for work subject to inspection under a residential dwelling code, three years experience as specified in section 103.3.5(2); or equivalent experience that provided knowledge as determined by the board of building standards. The experience must provide knowledge of different construction methods, processes and types.~~

~~**103.3.5.11** — **Medical gas piping inspector.** An applicant for a medical gas piping inspector certification shall provide evidence verifying that the applicant has been certified by an “American Society of Sanitary Engineering (ASSE)” recognized third party certifier in accordance with “ASSE” standard 6020.~~

~~**103.3.6 Certification procedure.** To qualify for full certification, applicants meeting the appropriate experience requirements of section 103.3.5 or of rule~~

~~4101:2-93-06 of the Administrative Code shall:~~

~~1. Be granted an interim certification which shall expire two years from the date of approval.~~

~~1.1 During the two year interim certification period, the certification holder may perform enforcement duties appropriate to the interim certification received, under contract or as an employee of a certified building department. Upon expiration of the two year interim certification, the individual is no longer permitted to perform these enforcement duties unless an extension is granted for good reason pursuant to this section.~~

~~1.2 Any individual whose two year interim certification has expired may not reapply for certification for one year after the interim certification has expired but the individual may apply to enter the trainee program as required in section 103.3.12~~

~~2. Complete the "Ohio Building Code Academy" requirements during the two year interim certification granted by the board.~~

~~**Exceptions:** Those individuals certified as medical gas piping inspectors pursuant to section 103.3.5.11, individuals certified as non-residential industrialized unit inspectors, or individuals certified as plumbing inspectors pursuant to Chapter 3783 of the Revised Code with five years experience as full time employees of the division of industrial compliance in the Ohio department of commerce or of county boards of health.~~

~~3. Furnish the board approved certification or evidence of passing board approved examinations for the appropriate certification category issued by a national model code organization or a testing agency or entity recognized by the board.~~

~~3.1 If the applicant has completed the "Ohio Building Code Academy" requirements and the interim certification has expired prior to completing all of the examination requirements, the board may consider certification of the individual if the applicant presents evidence of having completed the outstanding examination(s) required within the year following the expiration of the interim certification.~~

~~**103.3.6.1 — Interim certification extension.** The board may grant a one time, limited extension of the interim certification period upon submission of a request indicating the reason for the request and an~~

~~explanation of why the requirements have not been met within the two-year interim certification period.~~

~~**103.3.6.2** — **Required examinations.** Individuals are not required to have an application on file with the board before they can begin testing. Examinations may be completed before application is made for certification by the board.~~

~~**103.3.7** — **Personnel certification application, filing and processing.** Applications for certification shall be sent to the office of the board at least two weeks prior to a certification hearing. The application shall expire if not approved within one year of receipt by the board. Applications for certification as an electrical safety inspector shall be submitted at least two weeks prior to a meeting of the electrical safety inspector advisory committee.~~

~~Each applicant shall also submit, with the application, evidence sufficient to show the board that the applicant is qualified. Such evidence may include proof of the statements made in the application, documentary evidence, affidavits, transcripts, diplomas, published data, photographs, or legible reproductions of the same, or any other documentation.~~

~~**103.3.7.1** **Certification process.** Upon receipt of a completed application, the board of building standard's certification committee shall review the application and make a recommendation to the board of building standards.~~

~~**Exception:** Upon receipt of a completed application for certification as an electrical safety inspector, the electrical safety inspector advisory committee shall review the application and make a recommendation to the board of building standards.~~

~~The committees may ask for additional information to be submitted by the applicant prior to making a recommendation to the board. If a committee requests additional information from the applicant, failure to submit the requested information within ninety days from the date of the request may be cause for disapproval of the application by the board. After receiving a recommendation from a committee, the board shall hold a certification hearing to take action on the application. The applicant may be present at the certification hearing to respond to any questions from the board and all interested persons appearing at such certification hearing may be given an opportunity to comment.~~

~~**103.3.7.1.1** — **Certification, approval or denial.** Following the certification hearing, the board may approve, table pending further review and/or receipt of additional documentation, deny the application for certification, or take such other action as the board deems appropriate. If the board requests additional information, failure to submit the requested information within ninety days from the date of the request shall be cause for disapproval of the application by the board.~~

~~If the application is denied, in whole or in part, by the board of building standards, the applicant shall be notified in writing of such denial, the reason for the denial, and their rights of appeal pursuant to sections 3781.10, 3781.101, and Chapter 119 of the Revised Code.~~

~~**103.3.7.1.2** — **Records.** The board shall retain, as a part of applications which have been approved, any or all documents submitted or electronic versions of such documents, which shall be properly marked for identification and ownership.~~

~~**103.3.7.1.3** — **Board action.** All applications shall be considered individually by the board and the action taken shall be recorded in the minutes, noted on the application form, and the applicant notified as required.~~

~~**103.3.8** — **Issuance of certificate and renewal.** An appropriate certificate shall be issued to the applicant upon meeting of the qualification requirements of section 103.3, and payment of an initial fee of thirty dollars. The certificate shall state the certification classification being approved, expiration date, and limitations, if any, under which it has been issued.~~

~~The same fee shall apply to applicants granted interim approval and the term of the certification, if subsequently issued, shall begin on the date of interim approval.~~

~~**103.3.8.1** — **Renewal.** The certificate holder shall renew at three year intervals.~~

~~**103.3.8.2** — **Applications for renewal.** Applications for renewal of a certification shall be submitted to the board of building standards at least thirty days prior to the expiration date. In addition to a completed~~

~~application form prescribed by the board, applicants for renewal of certification shall submit a certification renewal fee of thirty dollars and evidence of having attended board sponsored required continuing education courses or their board approved equivalents and, other than Medical Gas Piping Inspectors, successfully completed thirty hours of approved educational courses prior to the expiration of the current certification.~~

~~**Exception:** Applications for renewal of medical gas piping inspector certifications shall include evidence verifying that the applicant's certification by an "ASSE" recognized third party certifier, in accordance with "ASSE" standard 6020, has been renewed.~~

~~**103.3.8.3 — Failure to renew.** Any individual whose certification has expired through failure to renew may obtain a renewal within one year from the date of its expiration provided the holder has met all requirements for renewal, including payment of the renewal fee. All applications for renewal of expired certifications shall be processed as renewals during the one year period following expiration. All applications for renewal of expired certification submitted more than one year following the expiration shall be processed as a new application. In addition, if a holder of an expired certification that submits an application for renewal more than one year following the expiration shall also be required to satisfy the continuing education requirements prior to recertification. The holder of a certification that has expired shall not perform any duties for which a certification is required.~~

~~**103.3.9 — Continuing education.** Holders of board certifications shall attend mandatory continuing education courses and, other than medical gas piping inspectors who maintain their certification in accordance with ASSE standard 6020, complete at least thirty hours of board approved continuing education in their respective classification prior to the expiration date of the certification.~~

~~**103.3.9.1 — Applications for approval.** Applications for continuing education course approval shall be on forms prescribed by the board and submitted at least seven (7) days prior to the meeting of the board's education committee or the electrical safety inspectors advisory committee for continuing education courses for electrical safety inspectors. (A meeting schedule is available on the board of building standards' web page at~~

~~<http://www.com.ohio.gov/dico/BBS.aspx>~~

~~**103.3.9.2** — **Application review.** Upon receipt of a complete application for course approval, the board of building standards education committee shall review the application and make a recommendation to the board. Following receipt of the committee's recommendation, the board may approve, table pending further review and/or receipt of additional documentation, deny the application for course approval, or take such other action as the board deems appropriate.~~

~~**103.3.9.2.1** — **Course approval.** Continuing education course approvals will expire on December 31 of each year. Approved courses will be issued a course approval number with the prefix "BBSyyyy" based on the calendar year of the current code cycle. The instructor or sponsor of any course(s) intended to be taught in a subsequent year, upon or near the expiration date of a current approval, shall resubmit an application for each course requesting an update. If approved, the instructor or sponsor shall receive a new approval and approval number for each course for the subsequent year. Any application for a course update shall be processed administratively as long as the course content has not changed.~~

~~**103.3.9.3** — **Course credit.** Board approved courses shall establish hour equivalencies for continuing education credit for each of the classifications requested. Course credit shall only be given for training in the respective classification. Courses approved for more than one certification classification may be applied to each certification for which training is required. No credit shall be approved for duplicate courses within the same certification period. Instructors of board approved courses may apply course hours taught toward their own board certification continuing education requirements except for duplicate courses within the same certification period.~~

~~**103.3.9.4** — **Approved course sponsor requirements.** The following are requirements that apply to all approved continuing education courses:~~

- ~~1. Date(s), time(s), and location(s) the course will be taught shall be provided to the board prior to the course presentation;~~
- ~~2. If course content is modified, the course must be resubmitted for course approval;~~

- ~~3. When promoting an approved course, the instructor shall make full and accurate disclosure regarding course title, course approval number, number of contact hours, certifications for which approval has been given, and all fees to be charged;~~
- ~~4. Course sponsors shall provide participants with a certificate of completion containing the name of the participant, title of approved course, BBS approval number, date and location of session, number of contact hours awarded, certification types for which course is approved, and signature of authorized sponsor or instructor;~~
- ~~5. The sponsors of an approved continuing education course shall provide the board with a legible copy of a list of participants who completed the course including: course name, date, and location of the session;~~
- ~~6. Participants must attend the complete course(s) as presented by the instructor to receive the contact hours approved by the board. No partial credit shall be given to any participant failing to complete the entire course as approved. The sponsor shall verify the participant's attendance and completion of the course; and,~~
- ~~7. The board does not provide retroactive approval for continuing education courses presented prior to submission of an application for approval.~~

~~**103.3.9.5** — **Failure to complete.** Failure to complete the number of hours required shall result in forfeiture of the certification. It shall be the responsibility of the certificate holder to furnish the board with proof of completion of all board approved courses for which credit is sought.~~

~~**103.3.10** — **Personnel certification, revocation or suspension.** In accordance with division (E) of section 3781.10 of the Revised Code, a personnel certification may be revoked or suspended on written complaint to the board of building standards by any person affected by the exercise of the authority granted under such certification, or by the board on its own motion pursuant to this section.~~

~~**103.3.10.1 Complaint process.** Upon receipt of a written complaint against a holder of a board certification that is substantiated by demonstrable evidence or upon the board's own motion:~~

- ~~1. The board shall decide whether the information submitted warrants causing an investigation to be initiated or sending a notice of opportunity for hearing as outlined in item 4 below;~~
- ~~2. If a formal investigation is warranted, the subject of the investigation shall be notified that an investigation has been initiated by the board;~~
- ~~3. Upon completion of the investigation, findings shall be reported to the board.~~
- ~~4. The board may dismiss the complaint, table the matter for future action, or initiate action to suspend or revoke the certification. If the board issues an order to suspend or revoke the certification it shall:
  - ~~4.1 Notify the certificate holder of the charges, pursuant to section 103.3.10.2, by certified mail, return receipt requested. The certificate holder shall be informed that a hearing, if desired, must be requested within thirty days from the date of the mailing to request a hearing before the board. The order shall inform the certificate holder that counsel may represent the certificate holder at the hearing. Failure by the certification holder to request a hearing within thirty days from the date of the mailing of the notification may cause the board, after a hearing, to uphold an order revoking or suspending certification;~~
  - ~~4.2 Schedule a hearing to be held seven to fifteen days after receipt of the request. The board may continue or postpone the hearing upon application by the party or upon its own motion;~~
  - ~~4.3 The board may appoint a hearing officer to conduct a hearing.~~
  - ~~4.4 A hearing will be conducted during which parties and witnesses can be examined and offer testimony, in a manner that prevents unnecessary delay, and that ensures the development of a clear and adequate record.~~~~

~~4.4.1. The hearing shall be conducted pursuant to the provisions of sections 3781.10, 3781.101, and 119.09 of the Revised Code;~~

~~4.5 If a hearing officer has been appointed, then within thirty days after the hearing, the hearing officer shall submit a written report of the findings of fact and recommendations to the board for its consideration.~~

~~5. Following the hearing, the party affected shall be sent a certified copy of the board's action and informed by certified mail, return receipt requested, that the certification holder may appeal the order within fifteen days to the court of common pleas in Franklin county pursuant to sections 3781.10, 3781.101, and 119.12 of the Revised Code.~~

~~**103.3.10.2 Grounds for revocation or suspension.** The board, upon its own motion or upon written complaint of any person affected by the enforcement of the board's rules, the approval of plans and specifications, or the making of inspections, shall investigate the actions of the holder of a certificate if there is an allegation implying one or more of the following:~~

- ~~1. The practice of fraud or deceit in obtaining the certificate;~~
- ~~2. A felony or crime involving moral turpitude;~~
- ~~3. Gross negligence, incompetence, misconduct in performance of duties, or engaging in conduct that is considered a conflict of interest;~~
- ~~4. Failure to complete the continuing education requirements prior to expiration date of the certificate;~~
- ~~5. Violation of the duties described in section 104.~~

~~**103.3.10.3 Revocation or suspension.** In the event of suspension or revocation of a certification, the individual shall no longer hold out to the public or any jurisdiction that the individual is certified to exercise enforcement authority or holds the board certification which has been suspended or certification revoked.~~

~~**103.3.10.4 Probationary status.** In the event of an investigation in which the board decides not to immediately suspend or revoke an individual's~~

~~certification, the board may place the individual on probationary status for a period of time and require remedial action as the board deems appropriate. During this time the individual shall comply with the training, reporting, auditing, or other remedial action. The board is authorized to revoke or suspend the individual's certification for failure to comply with such remedial requirements.~~

~~**103.3.11 Elective Temporary Suspension.** Certifications may be placed in elective temporary suspension upon written request to and approval by the board. Except for emergency circumstances, requests shall be in writing at least sixty days prior to the certification expiration date and supported by satisfactory evidence that the holder is withdrawing from active employment for which the certification is required.~~

~~**103.3.11.1 Restoring certification.** Certifications placed in elective temporary suspension for a period of time not to exceed one three-year term following the expiration date may be restored to active status by the board upon written request. The request shall be supported by satisfactory evidence that the holder has completed thirty hours of continuing education for that certification and any board-sponsored mandatory training required, or their board-approved equivalents, during the time the certification was in suspension prior to the date of reinstatement. Payment of the thirty dollar renewal fee shall accompany the request.~~

~~**103.3.11.2 Failure to restore certification.** Certifications placed in elective temporary suspension for a period of time exceeding one three-year term following the original certification expiration date may be restored to active status by the board upon written request supported by evidence of passing of the appropriate examinations prescribed by the board, completion of the "Ohio Building Code Academy," and payment of the thirty dollar renewal fee.~~

~~**103.3.12 Trainee program requirements.** Individuals seeking certification as a trainee shall meet the requirements of this section.~~

~~**103.3.12.1 Trainee applicants.** Trainees shall meet the following requirements:~~

- ~~1. A trainee applicant shall be a full-time employee of a political subdivision.~~

- ~~2. A trainee applicant shall be under the direct supervision of a trainee supervisor.~~
- ~~3. A master plan examiner trainee applicant shall also be a graduate of an "NAAB," "EAC ABET," or similarly accredited architecture or engineering university program.~~
- ~~4. A building inspector or mechanical inspector trainee applicant shall also have at least one year experience as a skilled tradesman for work subject to inspection under either a model building code of a national model code organization or a code adopted for buildings or structures and within the scope of groups regulated by the rules of the board or shall submit evidence of eligibility for education credit pursuant to section 103.3.12.6.~~
- ~~5. A plumbing inspector trainee applicant shall have at least three years experience in the installation of plumbing subject to inspection under either a model building code of a national model code organization or a code adopted for buildings or structures and within the scope of groups regulated by the rules of the board, or comply with the provisions of section 103.3.5(2). Applicants may submit evidence of eligibility for education credit pursuant to section 103.3.12.6.~~
- ~~6. An electrical safety inspector trainee shall have two years experience in the installation of electrical systems subject to inspection under either a model building code of a national model code organization or a code adopted for buildings or structures and within the scope of groups regulated by the rules of the board or shall submit evidence of eligibility for education credit pursuant to section 103.3.12.6.~~

~~**103.3.12.2 — Trainee supervisors.** A trainee supervisor shall:~~

- ~~1. Be a full-time employee of the same political subdivision as the trainee and shall be available to the trainee during normal working hours;~~
- ~~2. Currently possess the certification for which the trainee is being trained;~~
- ~~3. Be responsible for no more than two trainees at one time and shall immediately notify the board of the trainee(s) under supervision;~~

- ~~4. Notify the board of any change in supervisor or trainee status within thirty days;~~
- ~~5. Supervise, check, and sign the trainee's inspections and reports or a plans examiner trainee's plans examinations; and~~
- ~~6. Provide to the board a report documenting at least twenty five inspections or plans examinations made yearly by the trainee under the direct supervision of the trainee supervisor, with an evaluation of the trainee at the end of the first six months of the program, at the end of one year, and annually afterward.~~

~~**Exception:** The trainee supervisor of a trainee engaged in making electrical inspections shall supervise and check the trainee's work and be responsible for and sign off on all of the trainee's inspections, reports, and interpretations.~~

~~**103.3.12.3 Trainee sponsor requirements.** The trainee sponsor (county, township, or municipal corporation) shall:~~

- ~~1. Direct the building official to certify to the board that the trainee is a full time employee of the county, township, or municipal corporation and is under the direct supervision of an individual possessing the certification for which the trainee is being trained; and~~
- ~~2. Provide the trainee with a copy of the current rules of the board.~~

~~**103.3.12.4 Trainee certification.** The board shall issue a trainee certification to each applicant who has met the qualification requirements. The certification shall expire four years from the date of applicant approval by the board. After a minimum of two years and upon satisfactory completion of the trainee program pursuant to section 103.3.12.5, the trainee may apply for certification in the respective classification. The trainee certification is not renewable and upon expiration the individual may not reapply as a new trainee for a period of one year.~~

~~**103.3.12.5 Trainee course and work requirements.** A building, mechanical, or plumbing inspector trainee shall attend and successfully complete two hundred hours of approved courses. During the first year~~

~~the trainee shall complete at least one hundred hours of course work, including completion of the “Ohio Building Code Academy” requirements in section 103.3.6, and complete the second one hundred hours prior to completion of the trainee program. The trainee shall perform at least twenty five inspections annually while in the trainee program under the direct supervision of the trainee supervisor. The trainee shall also complete the appropriate examination requirements in section 103.3.6(2) prior to the completion of the trainee program.~~

~~**Exception:** An electrical safety inspector trainee shall attend and successfully complete two approved thirty-hour courses and related tests covering the fundamentals of electricity and the “National Electrical Code.” During the first year, the trainee shall attend one of the two courses and pass the related test. The second course and test shall be successfully completed prior to the examination for a certification.~~

~~A master plans examiner trainee shall perform at least twenty five plans examinations yearly under the direct supervision of the trainee supervisor, complete at least ten hours of approved continuing building code education courses yearly, and become registered in Ohio as an architect or professional engineer prior to the completion of the trainee program. The trainee shall also complete the appropriate examination requirements in section 103.8 prior to the completion of the trainee program.~~

~~**103.3.12.6 — Education credit.** An applicant for a building, mechanical, plumbing inspector, or trainee certification may obtain credit for one year of the required experience through education, if one of the following is met:~~

- ~~1. The applicant shall document nine hundred or more contact hours of training in an Ohio department of education approved vocational education program at the high school or adult level; or~~
- ~~2. The applicant shall document the completion of a baccalaureate degree or an associate degree program in building design or construction.~~

~~An applicant for electrical safety inspector trainee may obtain credit for one year of the required experience through approved vocational training in the fundamentals of electricity.~~

~~103.3.12.6.1 — Documentation. Supporting documentation may include a certificate of completion, a career passport, a transcript, a college degree or diploma granted by an accredited or state sponsored institution.~~

~~103.3.12.6.2 — Educational programs. Education credit shall not be prorated or combined for partial or full credit and shall be awarded only upon successful completion of a specific educational program. Miscellaneous course work or isolated classes shall not be considered.~~

~~Vocational instructional programs that are acceptable for credit include:~~

- ~~1. Air conditioning, heating, and ventilation.~~
- ~~2. Carpentry.~~
- ~~3. Electricity.~~
- ~~4. Masonry.~~
- ~~5. Plumbing and pipefitting.~~
- ~~6. Fire fighting.~~

~~103.3.12.6.3 — Other programs. The successful completion of other specific vocational instructional programs of a minimum of nine hundred contact hours may be considered by the board if the training is directly related to the design and construction of buildings or structures within the scope of groups regulated by the rules of the board.~~

~~103.3.12.6.4 — Associate degrees. Technical education instructional programs offering associate degrees include:~~

- ~~1. Architectural/construction technology.~~
- ~~2. Heating and air conditioning technology.~~
- ~~3. Fire science technology.~~

- ~~4. The successful completion of other specific technical education instructional programs offering degrees may be considered by the board if the training is directly related to the design and construction of buildings or structures within the scope of groups regulated by the rules of the board.~~

~~**103.4 Local boards of appeals certification.** Before hearing and deciding the adjudication hearings referred to in section 109 within the jurisdiction of and arising from orders of the local building official in the enforcement of Chapters 3781. and 3791. of the Revised Code and rules adopted thereunder, the board shall certify the local board of appeals.~~

~~The list of certified local boards of building appeals shall be made available upon request and shall be posted on the board's website at <http://www.com.ohio.gov/dico/BBS.aspx>.~~

~~**103.4.1 Application for certification, local board of building appeals.**~~

~~Certification, direct or by contractual agreement, shall be upon application to and on a form prescribed by the board of building standards. Upon receipt of an application, the board of building standard's certification committee shall review the application and make a recommendation to the board of building standards. The committee may ask for additional information to be submitted by the applicant prior to making a recommendation to the board. If the committee requests additional information from the applicant, failure to submit the requested information within ninety days from the date of the request may be cause for disapproval of the application by the board. After receiving a recommendation from the committee, a certification hearing on the application shall be conducted by the board of building standards. An authorized representative of the municipality or county seeking certification may be required to attend to give testimony to respond to any questions from the board. The board shall give all interested persons appearing at such certification hearing an opportunity to be heard. All persons desiring to be heard at the certification hearing shall first be duly sworn or affirmed and a record of the proceeding shall be made by the board.~~

~~The application shall be submitted, at least two weeks prior to a certification hearing, as an original and six copies with the following information:~~

- ~~1. A copy of the charter provision, ordinance or resolution establishing the local board of building appeals and providing for the appointments in accordance with section 103.4.3;~~

~~**Note:** Certified building departments applying for contractual agreement with a certified board of another political subdivision shall submit a copy of the ordinance or resolution from each party authorizing the contract along with a copy of the contract.~~

- ~~2. The name and resume of each member, including the date of appointment, term of office, professional qualifications and experience necessary for membership.~~

~~**103.4.2 Local board of building appeals certification, public hearing.** Upon receipt of a complete application, a public hearing on the application shall be conducted by the board of building standards. An authorized representative of the municipality, township, or county seeking certification may be present at the public hearing to give testimony or respond to any questions from the board. The board shall give all interested persons appearing at such public hearing an opportunity to be heard and explain their positions. A record of the proceeding shall be made by the board.~~

~~**103.4.2.1 Local board of building appeals certification, approval or denial.** If the application is denied in whole or in part by the board of building standards, the appropriate official in municipalities, board of township trustees in townships, or the board of county commissioners in counties requesting certification shall be notified in writing of such denial and the reason therefore and to their rights of appeal pursuant to sections 3781.10, 3781.101, and Chapter 119. of the Revised Code. The board of building standards upon review of the application shall certify a local board of building appeals if:~~

- ~~1. The applicant political subdivision has a building department certified pursuant to division (E) of section 3781.10 of the Revised Code and that certification is not by contract with another political subdivision;~~
- ~~2. The board is established pursuant to municipal charter, ordinance or resolution; and~~
- ~~3. The board membership meets the requirements of section 103.4.3.~~

~~The board of building standards upon review of the application shall certify a local board of building appeals per contract with another certified board if:~~

- ~~1. Both political subdivisions have authorized the contractual arrangement by ordinance or resolution and the contract properly executed reflects that arrangement; and~~
- ~~2. The political subdivision applying for the contract has a building department certified pursuant to section 3781.10 of the Revised Code.~~

~~**Exception:** Building departments certified by contract with the county building department in accordance with section 3781.10 of the Revised Code shall have the same board of appeals as that county.~~

~~**103.4.3. Composition and terms, local boards of building appeals.** The certified municipal and county boards of building appeals shall consist of five members who are qualified as follows:~~

- ~~1. One attorney, admitted to the Ohio bar;~~
- ~~2. One architect, registered in Ohio;~~
- ~~3. One structural engineer, registered in Ohio;~~
- ~~4. One mechanical engineer, registered in Ohio;~~

~~**Note:** each of these four members shall have recognized ability, broad training and experience in problems and practice incidental to the construction and equipment of buildings and structures.~~

- ~~5. One member representing organized labor, knowledgeable in the construction and equipment of buildings and structures.~~

~~**Exception:** Municipal boards may have more than five members and need not have an attorney member if the municipal charter so provided prior to October 13, 1983.~~

~~**103.4.3.1 Appointment.** Members shall be appointed for five year terms except that original appointments shall be for terms of one, two, three, four and five years.~~

~~**103.4.3.2 Term.** A member shall hold office from date of appointment until the end of the appointed term; however, the member shall continue in office following the term expiration date until a successor takes office or~~

~~until sixty days have elapsed, whichever occurs first.~~

~~**103.4.3.3 Vacancies.** Any member appointed to fill a vacancy occurring before the expiration of a term shall hold office for the remainder of that term.~~

~~**103.4.3.4 Reporting.** Vacancies and new appointments shall be reported to the board of building standards within thirty days. Notification of new appointments shall include resumes, date of appointment, term of office, qualifications and experience necessary for membership. An annual report shall be submitted to the board of building standards to provide the information required on the form provided by the board of building standards.~~

~~**103.4.4 Local board of building appeals certification, revocation.** In accordance with division (E) of section 3781.20 of the Revised Code, a certification may be revoked on written complaint to the board of building standards by any person affected by the exercise of the authority granted under such certification, or by the board on its own motion.~~

~~**103.4.4.1 Grounds for revocation.** The board of building standards on its own motion or on written complaint of any person affected by the local board of building appeals shall cause to be conducted such investigation to determine whether there is an allegation implying one or more of the following:~~

- ~~1. The presence of fraud;~~
- ~~2. Failure to adhere to applicable procedures set forth in Chapters 119. and 3781. of the Revised Code or rules made thereunder;~~
- ~~3. Failure to render decisions within thirty days of the hearing;~~
- ~~4. Granting of variances to provisions of rules of the board not adopted pursuant to Chapters 3781. and 3791. of the Revised Code but mandated by other chapters of the Revised Code;~~
- ~~5. Failure to notify organizations representing people with disabilities pursuant to section 3781.19 of the Revised Code;~~

~~6. Failure to permit an appeal for a de novo hearing before the state board of appeals or a direct appeal to the court of common pleas pursuant to section 3781.19 of the Revised Code.~~

~~**103.4.4.2 Complaint process.** When a complaint against a local board of building appeals has been received by the board, investigated, and found justified:~~

~~1. The board shall decide whether the information submitted warrants causing an investigation to be initiated or sending a Notice of Opportunity for Hearing as outlined in item 4 below;~~

~~2. If a formal investigation is warranted, the subject of the investigation shall be notified that an investigation has been initiated by the board;~~

~~3. Upon completion of the investigation, findings shall be reported to the board.~~

~~4. The board may dismiss the complaint, table the matter for future action, or initiate action to revoke the certification. If the board issues an order to revoke the certification it shall:~~

~~4.1 Notify the jurisdiction of the charges by certified mail, return receipt requested. The jurisdiction shall be informed that a hearing, if desired, must be requested within thirty days from the date of the mailing to request a hearing before the board. The order shall inform the jurisdiction that counsel may represent the certificate holder at the hearing. Failure by the jurisdiction to request a hearing within thirty days from the date of the mailing of the notification may cause the board, after a hearing, to uphold an order revoking certification;~~

~~4.2 Schedule a hearing to be held seven to fifteen days after receipt of the request, unless another date is mutually agreed upon by both parties. The board may continue or postpone the hearing upon application by the party or upon its own motion;~~

~~4.3 The board may appoint a hearing officer to conduct a hearing.~~

~~4.4 A hearing will be conducted during which parties and witnesses can be examined and offer testimony, in a manner that prevents~~

~~unnecessary delay, and that ensures the development of a clear and adequate record.~~

~~4.4.1. The hearing shall be conducted pursuant to the provisions of sections 3781.10, 3781.101, and 119.09 of the Revised Code;~~

~~4.5 If a hearing officer has been appointed, then within thirty days after the hearing, the hearing officer shall submit a written report of the findings of fact and recommendations to the board for its consideration.~~

~~5. Following the hearing, the board may dismiss the complaint or, when substantiated by the evidence, revoke the certification. When an order is upheld to revoke the certification, the jurisdiction affected shall be sent a certified copy of the board's action and informed by certified mail, return receipt requested, that the jurisdiction may appeal the order within fifteen days to the court of common pleas in Franklin county pursuant to sections 3781.10, 3781.101, and 119.12 of the Revised Code.~~

~~**103.4.4.3 Revocation.** In the event of the revocation of a certification, the jurisdiction shall no longer hold out to the public or any jurisdiction that the jurisdiction is certified to hear and decide the adjudication hearings referred to in section 110 within the jurisdiction or holds the board certification which has been revoked.~~

Refer to division 4101:7 of the Administrative Code for existing relocated building department, building department personnel, and boards of building appeals certification requirements.

## **Section 104**

### **Duties and responsibilities**

**104.1 General.** Personnel of building departments and local boards of appeals that have been certified by the board of building standards, pursuant to section 103, shall be responsible for performing the duties described in this section.

**104.2 Building department personnel duties and responsibilities.** Municipal, township, or county building departments certified by the board shall have

*personnel qualified to perform the enforcement duties and responsibilities described in this section.*

**104.2.1 Building official.** *The building official is responsible for the enforcement of the rules of the board and of Chapters 3781. and 3791. of the Revised Code relating to the construction, arrangement, and the erection of buildings or parts thereof. All building officials shall conduct themselves in a professional, courteous, impartial, responsive, and cooperative manner. The building official shall render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies, and procedures shall be in compliance with the intent and purpose of this code. Building officials shall be responsible to assure that a system is in place to track and audit all projects, to assure that all building department personnel perform their duties in accordance with this section, and for the overall administration of a building department as follows:*

**104.2.1.1 Applications and plan approvals.** *The building official shall receive applications, require or cause the submitted construction documents to be examined, ascertain by such examinations whether the construction indicated and described is in accordance with the requirements of this code, and shall issue plan approvals for the construction, erection, alteration, demolition, and moving of buildings and structures.*

**104.2.1.1.1 Plan examination by the building official.** *When the building department does not have in its full-time employ a certified master plans examiner, the certified building official shall examine construction documents to determine compliance with the rules of the board if the registered design professional elects to submit construction documents that contain a written certification by the registered design professional indicating conformance with the requirements of the rules of the board and Chapters 3781. and 3791. of the Revised Code.*

**104.2.1.2 Orders.** *The building official shall issue all orders in accordance with section 109 to ensure compliance with this code.*

**104.2.1.3 Inspections.** *If the plans for the erection, construction, repair, alteration, relocating, or equipment of a building are subject to inspection by the building official, under section 108, the building*

*official shall cause to be made such inspections, investigations, and determinations as are necessary to determine whether or not the work which has been performed and the installations which have been made are in conformity with the approved construction documents.*

***Exception:*** *Special inspections required under section 1704.*

***104.2.1.4 Department records.*** *The building official shall keep official records of applications received, certificates of plan approval issued, notices and orders issued, certificates of occupancy, and other such records required by the rules of the board of building standards. Such information shall be retained in the official permanent record for each project. One set of approved construction documents shall be retained by the building official for a period of not less than one hundred eighty days from date of completion of the permitted work, or as required by document retention regulations.*

***104.2.1.5 Department reports.*** *The building official shall be responsible for the submission of reports and any requested special information to the board of building standards as required in section 103.2.6. Failure to submit these reports as required by rule or by special request or inquiry of the board of building standards may be grounds for board action as described in section 103.3.10.*

***104.2.2 Plans Examiners.*** *A plans examiner is responsible for the examination of construction documents in accordance with section 107, within the limits of their certification, to determine compliance with the rules of the board. All plan examiners shall effectively communicate the results of their plan review as designated by the building official. A plans examiner shall conduct themselves in a professional, courteous, impartial, responsive, and cooperative manner.*

***104.2.2.1 Master plans examiner.*** *A master plans examiner is responsible for the examination of all types of construction documents to determine compliance with the rules of the board, except when the building official examines the construction documents pursuant to section 104.2.1.1.1.*

***104.2.2.1.1 Master plans examiner trainee.*** *A master plans examiner trainee is responsible for the examination of all types of construction documents to determine compliance with the rules of the board under*

*the direct supervision of an individual holding a master plans examiner certification.*

**104.2.2.1.2 Electrical plans examiner.** *An electrical plans examiner is responsible for the examination of construction documents related to electrical systems to determine compliance with the rules of the board.*

*If the department does not have in its employ or under contract persons holding the electrical plans examiner certification, then the examination of the construction documents for compliance with the electrical provisions of the code shall be done by the master plans examiner.*

**104.2.2.1.3 Plumbing plans examiner.** *A plumbing plans examiner is responsible for the examination of construction documents related to plumbing systems to determine compliance with the rules of the board.*

*If the department does not have in its employ or under contract persons holding the plumbing plans examiner certification, then the examination of the construction documents for compliance with the plumbing provisions of the code shall be done by the master plans examiner.*

**104.2.3 Inspectors.** *An inspector is responsible for performing inspections and determining that work, for which they are certified to make inspections, is performed in compliance with the approved construction documents. All inspectors shall inspect the work to the extent of the approval given when construction documents were approved by the building official and for which the inspection was requested. All inspectors shall effectively communicate the results of their inspections as required by section 108, and shall conduct themselves in a professional, courteous, impartial, responsive, and cooperative manner.*

**104.2.3.1 Building inspector.** *A building inspector is responsible to determine compliance with the approved construction documents in accordance with section 108.*

*A building inspector trainee is designated to determine compliance with approved construction documents, in accordance with section 108, under the direct supervision of an individual holding a building inspector*

*certification.*

**104.2.3.2 Plumbing inspector.** *A plumbing inspector is responsible to determine plumbing system compliance with approved construction documents in accordance with section 108.*

*A plumbing inspector trainee is designated to determine plumbing system compliance with approved construction documents, in accordance with section 108, under the direct supervision of an individual holding a plumbing inspector certification.*

**104.2.3.3 Electrical safety inspector.** *An electrical safety inspector is responsible to determine electrical systems compliance with approved construction documents in accordance with section 108.*

*An electrical safety inspector trainee is designated to determine electrical systems compliance with approved construction documents, in accordance with section 108, under the direct supervision of an individual holding an electrical safety inspector certification.*

**104.2.3.4 Elective inspectors.** *Building departments may elect to employ inspectors designated as responsible for determining that work, for which they are certified, to make inspections is performed in compliance with approved construction documents.*

**104.2.3.4.1 Mechanical inspector.** *A mechanical inspector is responsible to determine compliance with the approved construction documents for heating, ventilating and air conditioning (HVAC) systems, and the associated refrigeration, fuel gas, and heating piping systems in accordance with section 108.*

*If the department does not have in its employ or under contract persons holding the mechanical inspector certification, then the enforcement of the mechanical provisions shall be done by the building inspector;*

*A mechanical inspector trainee is designated to determine compliance with the approved construction documents for heating, ventilating and air conditioning (HVAC) systems, and the associated refrigeration, fuel gas, and heating piping systems, in accordance with section 108, under the direct supervision of an individual holding a mechanical*

*inspector certification.*

**104.2.3.4.2 Fire protection inspector.** *A fire protection inspector is responsible to determine compliance with approved construction documents for fire protection systems (automatic sprinkler systems, alternative automatic fire-extinguishing systems, standpipe systems, fire alarm and detection systems, and fire pump) in accordance with section 108.*

*If the department does not have in its employ or under contract persons holding the fire protection inspector certification, then the enforcement of the fire protection provisions shall be done by the building inspector.*

**104.2.3.4.3 Medical gas piping inspector.** *A medical gas piping inspector is responsible to determine compliance with approved construction documents for non-flammable medical gas, medical oxygen, and medical vacuum systems in accordance with section 108.*

*If the department does not have in its employ or under contract persons holding a medical gas piping inspector certification, then all enforcement of medical gas piping systems shall be deferred to either of the following: the local health district when that district requests to enforce those piping systems and the district has employed or hired under contract a person holding the medical gas piping inspector certification; or the superintendent of the division of industrial compliance in the department of commerce.*

**104.2.4 Liability.** *Liability of certified building department personnel for any tortious act will be determined by Ohio courts to the applicable provisions of Chapter 2744. of the Revised Code.*

**104.3 Certified boards of building appeals duties and responsibilities.** *Before performing its duties, a jurisdiction wishing to establish a local board of building appeals shall receive certification by the board of building standards as required in section 103.14.*

**104.3.1 Powers, local boards of building appeals.** *Certified municipal and county boards of building appeals shall hear and decide the adjudication hearings referred to in section 109.1 within the jurisdiction of and arising from orders of the local building official in the enforcement of Chapters 3781.*

and 3791. of the Revised Code and rules adopted thereunder. The orders may be reversed or modified by the board if it finds:

1. The order contrary to such laws or rules;
2. The order contrary to a fair interpretation or application thereof; or
3. That a variance from the provisions of such laws or rules, in a specific case, will not be contrary to the public interest where literal enforcement of such provisions will result in unnecessary hardship.

**104.3.2 State board of building appeals.** The Ohio board of building appeals shall conduct the adjudication hearings in political subdivisions without certified boards or without contracts with certified boards.

**104.3.3 Materials.** A certified board of building appeals may not prohibit the use of materials or assemblages authorized for statewide use by the board of building standards pursuant to section 3781.12 of the Revised Code.

**104.4 Violation of duties.** Any person affected by the improper actions of any building department, building official, plans examiner, inspector, fire protection system designer, or local board of building appeals certified by the board of building standards may file a written complaint with the board. Complaints will be processed by the board in accordance with the procedures outlined in the applicable certification rule found in division 4101:7 of the Administrative Code.

## **Section 105** **Approvals**

**105.1 Approvals required.** Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, or change the occupancy of a building or structure, or portion thereof, or to erect, install, enlarge, alter, repair, remove, convert or replace any electrical, gas, mechanical, plumbing system, other building service equipment, or piping 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 approval.

**105.1.1 Nonconformance approval.** When construction documents are submitted which do not conform with the requirements of the rules of the board, such documents may be approved by the building official provided

*such nonconformance is not considered to result in a serious hazard and the owner or owner's representative subsequently submits revised construction documents showing evidence of compliance with the applicable provisions of the rules of the board. In the event such construction documents are not received within thirty days, the building official shall issue an adjudication order revoking the plan approval.*

**105.1.2 Conditional approval.** *When construction documents are submitted which cannot be approved under the other provisions of this rule, the building official, may at the request of the owner or owner's representative, issue a conditional plan approval when an objection to any portion of the construction documents results from conflicting interpretations of the code, or compliance requires only minor modifications to the building design or construction. No conditional approval shall be issued where the objection is to the application of specific technical requirements of the code or correction of the objection would cause extensive changes in the building design or construction. A conditional approval is a conditional license to proceed with construction or materials up to the point where construction or materials objected to by the agency are to be incorporated into the building. The conditions objected to shall be in writing from the building official which shall be an adjudication order denying the issuance of a license and may be appealed in accordance with section 3781.19 of the Revised Code. In the absence of fraud or a serious safety or sanitation hazard, all items previously examined shall be conclusively presumed to comply with Chapters 3781. and 3791. of the Revised Code and the rules of the board. Reexamination of the construction documents shall be limited to those items in the adjudication order. A conditional plan approval is not a phased plan approval.*

**105.1.3 Previous approvals.** *This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful approval has previously been issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within one year of the approval of construction documents. One extension shall be granted for an additional year if requested by the owner at least ten days in advance of the expiration of the approval and upon payment of any fee not to exceed one hundred dollars. If, after the start of construction, work is delayed or suspended for more than six months, the approval is invalid. Two extensions shall be granted for six months if requested by the owner at least ten days in advance of the expiration of the approval and upon payment of any fee for each extension not to exceed one hundred dollars.*

**105.1.4 Phased approval.** *The building official shall issue an approval for the construction of foundations or any other part of a building, structure, or building service equipment before the construction documents for the whole building, structure or building service equipment have been submitted, provided that adequate information and detailed statements have been filed complying with applicable requirements of this code. The holder of such approval 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 an approval for the entire structure will be granted. Such approvals shall be issued for various stages in the sequence of construction provided that all information and data required by the code for that portion of the building or structure has been submitted. The holder of a phased plan approval may proceed only to the point for which approval has been given.*

**105.1.5 Annual approval.** *In lieu of an individual approval for each alteration to an existing electrical, gas, mechanical, plumbing, or piping installation, the building official may issue an annual approval upon application to any person, firm or corporation regularly employing individuals holding the related board certification in the building, structure or on the premises owned or operated by the applicant for the approval.*

**105.1.5.1 Annual approval records.** *The person to whom an annual approval is issued shall keep a detailed record of alterations made under such annual approval. The building official shall have access to such records at all times or such records shall be filed with the building official as designated. These records shall include the applicable construction documents in accordance with section 106.1.*

**105.2 Validity of approval.** *The construction, erection, and alteration of a building, and any addition thereto, and the equipment and maintenance thereof, shall conform to required plans which have been approved by the building official, except for minor deviations which do not involve a violation of the rules of the board. In the absence of fraud or a serious safety or sanitation hazard, any structure built in accordance with approved plans shall be conclusively presumed to comply with Chapters 3781. and 3791. of the Revised Code and the rules of the board.*

**Exception:** *Industrialized units shall be constructed to conform to the plans approved by the board.*

**105.3 Expiration.** *The approval of plans or drawings and specifications or data*

*in accordance with this rule is invalid if construction, erection, alteration, or other work upon the building has not commenced within twelve months of the approval of the plans or drawings and specifications.*

*One extension shall be granted for an additional twelve-month period if requested by the owner at least ten days in advance of the expiration of the approval and upon payment of a fee not to exceed one hundred dollars.*

**105.4 Extension.** *If in the course of construction, work is delayed or suspended for more than six months, the approval of plans or drawings and specifications or data is invalid. Two extensions shall be granted for six months each if requested by the owner at least ten days in advance of the expiration of the approval and upon payment of a fee for each extension of not more than one hundred dollars.*

**105.5 Certificate of plan approval.** *After plans have been approved in accordance with section 107, the building official shall furnish the owner/applicant a certificate of plan approval.*

**105.5.1 Content.** *The form of the certificate shall be as prescribed by the building official and shall show the serial number of the certificate, the address at which the building or equipment under consideration is or is to be located, the name and address of the owner, the signature of the building official who issued the certificate, and such other information as is necessary to facilitate and ensure the proper enforcement of the rules of the board.*

**105.5.2 Duplicate issued upon request.** *Upon application by the owner, the building official shall issue a duplicate certificate of plan approval to replace a lost or destroyed original.*

## **Section 106**

### **Construction documents**

**106.1 Submittal documents.** *Construction documents, statement of special inspections required and other data shall be submitted in two or more sets with each application for an approval. Before beginning the construction of any building for which construction documents are required under section 105, the owner or the owner's representative shall submit construction documents to the building official for approval. When construction documents have been found to be in compliance with the rules of the board of building standards in accordance with section 107 by a certified building department, that determination of compliance shall be deemed sufficient to obtain approval for construction*

*pursuant to section 105.2 and the building official shall issue the certificate of plan approval. Construction documents for the installation of industrialized units shall be submitted to the building official for approval in accordance with the provisions of section 106.1.2(1).*

**Exception:** *No construction documents need be filed with the division of industrial compliance for site installation of industrialized units used exclusively as one-, two-, or three-family dwellings.*

**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 coordinated and 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. Construction documents, adequate for the scope of the project, shall include information necessary to determine compliance with the building, mechanical, plumbing, fire, electrical, energy, and fuel gas codes such as:*

1. **Index.** *An index of drawings located on the first sheet which shall also include all occupancy classification(s), type(s) of construction, the area in gross square feet for each level, the maximum design occupant load, the structural design loads, and the seismic design category and site class;*
2. **Site plan.** *A site plan showing a north orientation arrow, the size and location of new construction and all existing structures on the site, all property and interior lot line locations with setback and side yard dimensions and distances from buildings to lot lines, the locations of the nearest streets, the established street grades, the locations, types and sizes of all utility lines, the location of any fences, and the elevations of all proposed finished grades; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The building official is authorized to waive or modify the requirement for a site plan when the application for approval is for alteration or repair or when otherwise warranted.*

**2.1 Buildings or structures located in flood hazard areas.**  
*Construction documents submitted for buildings or structures*

*located in communities with identified flood hazard areas, pursuant to section 1612, shall include the current FEMA "Flood Hazard Boundary Map" (FHBM), "Flood Insurance Rate Map" (FIRM) or "Flood Boundary Floodway Map" (FBFM) for the project location. The required site plan shall include building elevations using the same datum as the related flood hazard map. The owner shall be responsible for the compliance with local flood damage prevention regulations for additional critical elevation information for the project site.*

**2.2 Site Accessibility Plan.** *Information in plan view and details shall be submitted indicating compliance with the accessibility provisions of this code for the exterior of the building in addition to accessible features of the interior. When applicable, the plans shall include: the exterior accessible route between all facilities required to be connected; ramp locations and elevations along the exterior accessible route; number of and details for the required accessible van and car parking spaces and passenger loading areas; location and detail of required accessibility signage; grade/topographic elevations before and after proposed grading when site impracticality is intended to be applied.*

**3. Floor plans.** *Building configuration layout drawings with all walls and partitions shown including: plans of full or partial basements and full or partial attics and penthouses, grade elevations at the building perimeter, and references to other details and elevations. Floor plans must show all relevant information such as door swings, stairs and ramps, windows, shafts, all portions of the means of egress, plumbing fixtures, built-in fixtures, special equipment, vertical transportation, etc., and shall be sufficiently dimensioned to describe all relevant space sizes. Spaces shall be identified by appropriate code appellations (an "auditorium" may not be identified as a "meeting room" if its attributes indicate that it is an auditorium). The construction documents shall designate the number of occupants to be accommodated on every floor, and in all rooms and spaces;*

**4. Demolition.** *In the case of demolition, the floor plan shall identify construction to be demolished and the location, arrangement, and dimensions of existing construction that is to remain.*

5. **Roof plan.** *Roof outline, overall dimensions and dimensions of setbacks, slope of roof, drainage, reference to other details, roof materials, penetrations through roof, and roof-mounted equipment;*
6. **Exterior elevations.** *Vertical dimensions, floor-to-floor heights, opening heights, references to other details, floor lines, elevations of major elements, grade lines, foundation lines, material indications and notes, symbols for window schedule, gutters, signs and windows, doors, and all other openings.*
7. **Building sections.** *Vertical dimensions, elevations of the top of structural components and finish floor lines, materials, footings and foundations, reference to other details, ceiling lines, and major mechanical services.*
8. **Exterior building envelope.** *The exterior envelope shall be described in sufficient detail to determine compliance with this code and the referenced standards. Details shall be provided which describe flashing, intersections with dissimilar materials, corners, end details, control joints, intersections at roof, eaves, or parapets, means of drainage, water-resistive membrane details around openings, location and type of vapor retarders, window and door "U"-values, and insulation location and "R"-values. The supporting documentation shall fully describe the exterior wall system, which was tested, where applicable, as well as the test procedure used.*
9. **Wall Sections.** *Face of wall dimensions to other components, vertical dimensions from foundations to parapet relating all elements to top of structural elements, all connection methods, wall, ceiling, floor, foundation, and roof materials and construction details.*
10. **Interior elevations.** *Vertical dimensions to critical elements, references to other details, openings in walls, wall finishes, built-in items, and locations of switches, thermostats, and other wall-mounted equipment.*
11. **Schedules.** *Information or tables that describe the room finishes, doors, windows, and door hardware and controls. Wall and floor materials shall be described by cross-hatching (with explanatory key), by notation, or by other clearly understandable method.*

12. **Structure.** Complete structural description of the building including size and location of all structural elements and a table of live, wind, snow, and seismic loads used in the design of the building and other data as required to fully describe the structural system.
13. **Fire suppression system.** Areas of protection, fire suppression system occupancy hazard classification, and water supply data.
14. **Fire-resistance Ratings.** The fire-resistance ratings of all structural elements as required by this code, data substantiating all required fire-resistance ratings including details showing how penetrations will be made for electrical, mechanical, plumbing, and communication conduits, pipes, and systems, and the materials and methods for maintaining the required structural integrity, fire-resistance rating, and firestopping.
15. **System descriptions.** Complete description of the plumbing, mechanical and electrical systems, including: materials, insulation “R”-values, general routing and sizes of all piping; location and type of plumbing fixtures and equipment; plumbing schematics and isometrics; materials, insulation “R”-values, general routing and sizes of all ductwork, vents, and louvers; location and type of heating, ventilation, air conditioning, and other mechanical equipment; location and type of all fire alarm, lighting and power equipment; type and size of all electrical conductors.
16. **Operations.** Information shall be provided regarding operations, the types, quantities, and arrangement of flammable, combustible, or hazardous materials proposed to be produced, used, dispensed, or stored in the facility; material safety data sheets for hazardous materials produced, used, or stored in the facility, the commodity and arrangement of high piled or rack storage, control areas, etc.
17. **Additional information.** Additional graphic or text information as may be reasonably required by the building official to allow the review of special or extraordinary construction methods or equipment.

**106.1.1.1 Fire protection system drawings.** Construction documents shall be approved prior to the start of system installation. Related listing information shall be provided and drawings shall contain all information as required by the installation standards referenced in Chapter 9. The

*individual installing the fire protection systems, who shall be certified by the state fire marshal pursuant to section 3737.65 of the Revised Code, shall be identified on the drawings. In the event that the listing information is not known or the certified installer is not known at the time of plan examination, conditional plan approval shall be granted subject to subsequent submission of the listing information and the name of the certified installer prior to installation of any part of the fire protection systems.*

**106.1.1.2 Special inspections.** *Where application is made for construction as described in this section, the owner or the registered design professional in responsible charge acting as the owner's agent shall identify those special inspections needed during construction on the types of work listed under section 1704.*

**106.1.2 Special provisions.** *The following are special provisions:*

1. *When construction includes the use of industrialized units or alternative materials, designs and methods of construction or equipment approved by the board, documentation shall be provided to the building official describing how they are to be used. Before these items are installed or used, the following shall be submitted:*

*1.1 A copy of the construction documents approved by the board; and*

*1.2 Details pertaining to on-site interconnection of modules or assemblies.*

**Exception:** *When construction includes the use of industrialized units for one-, two-, and three- family dwellings and their accessory structures, the documents shall be provided to the residential building official. If no residential department is certified in a jurisdiction, construction documents for one-, two-, or three-family dwellings comprised of industrialized units are not required to be submitted for approval.*

2. *Construction documents submitted that include construction of public swimming pools shall include documentation indicating approval of the pool construction documents by the Ohio department of health in accordance with section 3109.1.1 of the "OBC".*
3. *Construction documents submitted that include alterations or construction*

*of, or additions to buildings where sales, display, storage or manufacture of consumer fireworks, 1.4g or display fireworks, 1.3g shall include documentation indicating that the applicant has received preliminary approval for construction issued by the state fire marshal pursuant to sections 3743.04 and 3743.17 of the Revised Code.*

- 4. The elevation certification provided by a registered surveyor and dry floodproofing certification, when required in section 1612.5 for buildings or structures located in communities with identified flood hazard areas, shall be submitted to the building official.*
- 5. When a certified building department receives an application for plan approval in a jurisdiction in which the local fire official has requested an opportunity to provide input to the certified building department on issues related to fire protection, the building official shall require that the applicant provide a set of relevant construction documents for the local fire official. The building official shall evaluate the local fire official's comments related to fire protection provisions of this code that are received within the timeframe established by the building official and section 3791.04 of the Revised Code prior to issuing the plan approval certification.*
- 6. Construction documents submitted that include alterations or construction of, or additions to jails, workhouses, or municipal lockups shall include documentation indicating that the applicant has received preliminary approval for construction issued by the Ohio department of rehabilitation and corrections.*
- 7. When, as a part of work subject to this code, construction includes or relates to the temporary or permanent storage of flammable or combustible liquids, such construction shall be in accordance with the provisions of this code and the fire code.*

**106.2 Evidence of responsibility.** *Required construction documents, when submitted for review as required under section 107, shall bear the identification of the person primarily responsible for their preparation.*

**106.2.1 Seal requirements.** *When it is required that documents be prepared by a registered design professional, the building official shall be authorized to require the owner to engage and designate on the approval application a registered design professional who shall act as the registered design*

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

*Where structural observation is required by section 1709, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur. See also duties specified in section 1704.*

*Construction documents shall bear the seal of a registered design professional pursuant to section 3791.04 of the Revised Code.*

**Exception:** *The seal of a registered design professional is not required on construction documents for:*

- 1. Buildings or structures classified as one-, two-, or three-family dwellings and accessory structures;*
- 2. Energy conservation design for buildings or structures classified as one-, two-, or three-family dwellings;*
- 3. Fire protection system designs submitted under the signature of an individual certified in accordance with section 107.4.4;*
- 4. Installation of replacement devices, equipment or systems that are equivalent in type and design to the replaced devices, equipment or systems; and*
- 5. Alterations, construction or repairs to any buildings or structures subject to sections 3781.06 to 3781.18 and 3791.04 of the Revised Code where the building official determines that the proposed work does not involve the technical design analysis of work affecting public health or general safety in the following areas: means of egress, structural, mechanical, electrical, plumbing, or fire protection.*
  - 5.1 For the purpose of this exception, technical design analysis is defined as the development of integrated solutions using analytical methods in accordance with established scientific and engineering principles.*

**106.3 Amended construction documents.** *If substantive changes to the building are contemplated after first document submission, or during construction, those changes must be submitted to the building official for review and approval prior to those changes being executed. The building official may waive this requirement in the instance of an emergency repair, or similar instance.*

**106.4 Alternative materials and methods of construction and equipment.** *For approval of a device, material or assembly that does not conform to the performance requirements in this code, section 114 shall apply.*

**106.5 Alternative engineered design.** *The design, documentation, inspection, testing and approval of an alternative engineered system shall comply with sections 106.5.1 to 106.5.3 of this rule.*

**106.5.1 Design criteria.** *An alternative engineered design shall conform to the intent of the provisions of this code and shall provide an equivalent level of quality, strength, effectiveness, fire resistance, durability and safety. Materials, equipment or components shall be designed and installed in accordance with the manufacturer's installation instructions.*

**106.5.2 Submittal.** *The registered design professional shall indicate on the application that the system is an alternative engineered design. The approval and permanent approval records shall indicate that an alternative engineered design was part of the approved installation. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.*

**106.5.3 Technical data.** *The registered design professional shall submit sufficient technical data to substantiate the proposed alternative engineered design and to prove that the performance meets the intent of this code.*

## **Section 107**

### **Plan approval process**

**107.1 Plan review required.** *Where the rules of the board are applicable under section 101.2, before a building or addition to a building is constructed or erected, and before a building is altered or relocated, or building equipment is installed, or there is a change of occupancy, or a resubmission of construction documents is required or received, construction documents relating to the work and equipment under consideration shall be prepared in conformity with section 106 and be submitted to the building department for examination and approval.*

**107.2 Application for plan approval.** *To obtain a plan approval, the owner or the owner's representative shall first file an application in writing on a form furnished by the building department for that purpose. Such application shall:*

- 1. Identify and describe the work to be covered for which application is made for approval.*
- 2. Describe the land on which the proposed work is to be done, street address or similar description that will readily identify and locate the proposed building or work.*
- 3. Indicate the use and occupancy(ies) for which the proposed work is intended.*
- 4. Be accompanied by construction documents and other information as required in section ~~106.3~~ 106.1.*
- 5. Be signed by the owner, or the owner's authorized agent.*
- 6. Give such other data and information as required by the building official.*
- 7. Identify and clearly indicate whether the project or portion of a project intends to utilize an industrialized unit, as defined in section 113.2.*
- 8. Identify and clearly indicate whether the project or portion of a project intends to utilize an assembly of individually listed or labeled products.*

**107.2.1 Time limitation of application.** *The approval of plans under this section is a "license" and the failure to approve such plans as submitted within thirty days after filing or the disapproval of such plans is an "adjudication order denying the issuance of a license" requiring the opportunity for an "adjudication hearing" as provided by sections 119.07 to 119.13 of the Revised Code and as modified by sections 3781.031 and 3781.19 of the Revised Code. In accordance with section 109, an adjudication order denying the issuance of a license shall specify the reasons for such denial.*

*If construction documents have been reviewed for compliance with the rules of the board, an adjudication order has been issued to the owner and the owner's representative, and the owner has neither exercised the right to appeal pursuant to section 110 nor resubmitted corrected documents,*

*the application is invalid six months from the date of the issuance of the adjudication order.*

**107.3 Order of plan review.** *Construction documents submitted for approval shall be examined for compliance with the rules of the board in the order received, unless otherwise consented to by the building owners affected by deferred examination.*

**107.4 Review of plans.** *When construction documents have been submitted to the building department for review and approval, the building official shall cause the construction documents to be examined for compliance with the rules of the board by assigning the examination duty to an appropriately certified plans examiner. The plans examiner shall first determine whether the construction documents are adequate as required in section 106. If so, the plans examiner shall examine the construction documents to determine compliance with the rules of the board.*

**107.4.1 Inadequate construction documents.** *If construction documents are determined to be incomplete or inadequate for examination, the plans examiner shall report the findings to the building official. The plans examiner shall examine the construction documents to the extent possible and identify what information from section 106 is missing and needed to complete the required examination. Upon receipt and review of the report, the building official shall proceed as required in section 107.6.*

**107.4.2 Resubmitted documents.** *If construction documents are resubmitted in response to an adjudication order, the review for compliance shall be limited to determining that the item of non-compliance, and any work affected, has been corrected and shall not be deemed to authorize another review of unmodified construction documents previously determined to comply.*

**107.4.3 Sealed construction documents.** *Construction documents which have been prepared by an Ohio registered design professional who prepared the same as conforming to the requirements of the rules of the board pertaining to design loads, stresses, strength, and stability, or other requirements involving technical analysis, need be examined only to the extent necessary to determine conformity of such construction documents with other requirements of the rules of the board.*

**107.4.4 Fire protection system construction documents.** *Construction*

*documents for fire protection systems authorized to be submitted by individuals certified pursuant to Chapter ~~4101:2-874~~101:7-5 of the Administrative Code shall:*

- 1. When submitted under the signature of an individual certified under section 3781.105 of the Revised Code, be processed in the same manner as construction documents submitted under the signature of a registered design professional. Any statistical data, reports, explanations, plan description, or information that would not also be required for a similar submission by a registered design professional need not be submitted by a certified designer.*
- 2. If certified by a registered design professional or individual certified under section 3781.105 of the Revised Code as conforming to requirements of the rules of the board pertaining to design loads, stresses, strength, stability, or other requirements involving technical analysis, be examined by the building department official only to the extent necessary to determine conformity of such construction documents with other requirements adopted by the board under Chapters 3781. and 3791. of the Revised Code.*

***107.5 Plan review, compliance with rules of the board.*** *If the construction documents are determined to comply with the rules of the board, the plans examiner shall communicate the findings and recommend the conditions and type of approval to the building official.*

***107.5.1 Building official approval.*** *The building official shall evaluate the plans examiner's recommendations and any communications received from the fire official as described in section 106.1.2. When the construction documents have been determined to conform to the applicable provisions of the rules of the board, the building official shall endorse or stamp such plans as approved and issue the certificate of plan approval in accordance with section 105.5.*

***107.5.2 Posting.*** *The certificate of plan approval shall be posted in a conspicuous location on the site. The owner and the contractor shall preserve and keep the certificate posted until the final inspections have been completed.*

***107.6 Plan review, items of noncompliance.*** *When the construction documents are examined and items of noncompliance with the rules of the board are found*

*by the plans examiner, the building official shall proceed as required in either section 107.6.1 or section 107.6.2.*

**107.6.1 Communication process for items of non-compliance.**

1. *Item(s) of non-compliance shall be communicated to the owner or the owner's representative and offer the following options:*
  - 1.1. *The owner will revise the drawings and resubmit to the department.*
  - 1.2 *The items of noncompliance will not be brought into compliance and will be referred to the building official as indicated in item 4 below.*
2. *The owner or the owner's representative shall indicate which option (item 1 above) will be exercised.*
3. *Notations of the communication shall be made on a plan review record. The notations shall include the plans examiner's name, the date of the communication with the owner or the owner's representative, the observed items of noncompliance, the code citation related to the item(s) of noncompliance, the action necessary to correct the item(s) of noncompliance, the option chosen by the owner or the owner's representative, the name of the person communicated with, and the estimated dates of compliance and resubmission, if applicable.*
4. *If the owner or the owner's representative indicates that the work will not be brought into compliance with the rules of the board or requests an adjudication order, the plans examiner shall report to the building official in accordance with section 107.6.2.*

**107.6.2 Building official determination of noncompliance.** *The building official shall evaluate the plans examiner's report and any reports received from the fire official as described in section 106.1.2 and render a final determination as to whether the items of non-compliance are to be communicated to the owner in the form of an adjudication order complying with section 109. The building official shall also determine whether any approvals are possible, and issue the appropriate approval as described in section 105.*

**107.7 Approved construction document sets.** *One set of approved construction documents shall be kept by the building official. The other set(s) shall be returned to the applicant, kept at the work site, along with manufacturers'*

*installation instructions and product information, and shall be available for use by the inspector.*

### **Section 108** **Inspection process**

**108.1 General.** *After construction documents have been approved, construction or work may proceed in accordance with the approved documents. Construction or work for which an approval is required shall be subject to inspection. It shall be the duty of the owner or the owner's duly authorized representative to notify the building department when work is ready for inspection. Access to and means for inspection of such work shall be provided for any inspections that are required by this code.*

*It shall be the duty of the owner or the owner's authorized representative to cause the work to remain accessible and exposed for inspection purposes. Such construction or work shall remain accessible and exposed for inspection purposes until the work has been inspected to verify compliance with the approved construction documents, but failure of the inspectors to inspect the work within four days, exclusive of Saturdays, Sundays, and legal holidays, after the work is ready for inspection, allows the work to proceed.*

*Subsequent work is allowed to proceed only to the point of the next required inspection.*

**108.2 Required inspections.** *At the time that the certificate of plan approval is issued, the building official shall provide, to the owner or the owner's representative, a list of all required inspections for each project. The required inspection list shall be created from the applicable inspections set forth in sections 108.2.1 to 108.2.14. The building official, upon notification from the owner or the owner's agent that the work is ready for inspection, shall cause the inspections set forth in the required inspection list to be made by an appropriately certified inspector in accordance with the approved construction documents.*

**108.2.1 Lot line markers required.** *Before any work is started in the construction of a building or an addition to a building to which the rules of the board are applicable under section 101.2, all boundary lines shall be clearly marked at their intersections with permanent markers or with markers which are offset at a distance which is of record with the owner.*

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

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

**108.2.4 Lowest floor elevation.** The elevation certification required in section 1612.5 shall be submitted to the building official.

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

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

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

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

**108.2.8 Energy efficiency inspections.** Inspections shall be made to determine compliance with Chapter 13 of the “OBC” and shall include, but not be limited to, inspections for: envelope insulation “R” and “U” values, fenestration “U” value, duct system “R” value, infiltration air barriers, caulking/sealing of openings in envelope and ductwork, and “HVAC” and water heating equipment efficiency.

**108.2.9 Building services equipment inspections.** Inspections shall be made

*of all building services equipment to ensure that it has been installed in accordance with the approved construction documents, the equipment listings, and the manufacturer's installation instructions. Inspections shall include, but not be limited to, inspections for the following systems and their associated components: mechanical heating and ventilating systems, mechanical exhaust systems, plumbing systems, fire protection systems, and electrical systems.*

**108.2.10 Other inspections.** *In addition to the inspections specified above, the building official is authorized to cause to be made or require other inspections of any construction work to be made to ascertain compliance with the provisions of this code.*

*Where applications are submitted for projects of unusual magnitude of construction, the building official may require inspections or full-time project representation by a registered design professional or inspection agency. This inspector/project representative shall keep daily records and submit reports as required by the building official.*

**Exception:**

*Where the building official requires full-time project inspection, the installation of a fire protection system may be inspected by a person certified under section 3781.105 of the Revised Code. The person shall be certified in the appropriate subfield of fire protection systems being inspected – water-based fire protection systems (formerly automatic sprinkler systems), fire alarm, or special hazards systems design.*

**108.2.11 Special inspections.** *For special inspections, see section 1704.*

**108.2.12 Inspections, completion.** *When all of the required successive inspections have been satisfactorily completed and the inspectors have verified compliance with the approved construction documents, the inspectors shall communicate their findings to the building official. The building official, after review of the findings, shall issue the certificate of occupancy as described in section 111.*

**108.2.13 Industrialized unit inspections.** *Approved industrialized units and the on-site construction to complete the installation of the industrialized units shall be inspected. Such inspections shall include:*

1. *Connection to on-site construction, interconnection of modules, connection to utilities. The inspections and conducting of required tests shall not require the destruction or disassembly of any factory-constructed component authorized by the board.*
2. *Inspection of the unit for damage resulting from transportation, improper protection of exposed parts from inclement weather or other causes. Damage shall be repaired as required by the building official to comply with the applicable provisions of the rules of the board;*
3. *Inspection of the unit to determine if it is marked by an insignia furnished by the board; and*
4. *Inspect the unit to determine if the floor plan, exterior elevations, and exposed details are in conformance with the plans approved by the board.*

**108.3 Inspection agencies.** *The building official is authorized to accept reports of approved inspection agencies, provided such agencies are approved in accordance with the rules of the board of building standards.*

**108.4 Right of entry.** *The building official, or the building official's designee, is authorized to enter the structure or premises at reasonable times to inspect or to perform the duties imposed by this code, provided that credentials are presented to the occupant and that entry is requested and obtained. Where permission to enter has not been obtained, is denied, or the building official has probable cause to believe that there exists in a structure or upon a premises a condition which is a serious hazard the building official shall proceed as required in section 109 and shall also have recourse to the remedies provided by law to secure entry.*

**108.5 Inspections, compliance with construction documents.** *When an inspector from the department having jurisdiction finds that completed work is in accordance with the approved construction documents, the inspector shall communicate the findings to the owner's on-site representative, shall make a note of the satisfactory inspection on an on-site inspection record and in the inspector's log, and communicate their findings to the building official. The building official, after review of the findings, shall issue the certificate of occupancy in accordance with section 111.*

**108.6 Inspections, observation of violations, unsafe conditions, or serious hazards.** *When an inspector from the department having jurisdiction finds that*

*any work in connection with the location, erection, construction, repair, alteration, moving, or equipment of a building is contrary to the approved construction documents for the same, the building inspector shall proceed as required in either section 108.6.1 or 108.7.*

***108.6.1 Communication process for work contrary to approved construction documents.***

- 1. Communicate the nature of the differences to the owner or the owner's on-site representative and offer the following options*
  - 1.1 The owner will bring the item of noncompliance into compliance,*
  - 1.2 The owner will revise the drawings and resubmit to the department,*
  - 1.3 The items of noncompliance will not be brought into compliance and will be referred to the building official as indicated in item 4 below.*
- 2. The owner or the owner's on-site representative shall indicate which option (item 1 above) will be exercised*
- 3. Notations on the on-site inspection record and in the inspector's log shall be made. The notations shall include the inspector's name, the date of the inspection, the type of inspection, the observed items of noncompliance, the option chosen by the owner or the owner's on-site representative, the name of the person communicated with, and the estimated dates of compliance and follow-up inspections, if applicable.*
- 4. If the owner or the owner's on-site representative indicates that the work will not be brought into compliance with the approved construction documents, the inspector shall submit a report to the building official for the final determination of noncompliance in accordance with section 108.7.*

***108.6.2 Observation of violations not shown on plans.*** *If an inspector, in the course of performing the assigned or requested inspections, observes a code violation that was either shown incorrectly or not adequately addressed or detailed in the approved construction documents, the inspector shall communicate the finding to the building official so that the*

*building official can make a determination of whether the code violation is of such significance to warrant communicating the finding to the owner or the owner's representative as a recommended change.*

**108.6.3 Observation of unsafe conditions or serious hazards.** *If an inspector, in the course of performing the assigned or requested inspections, observes an unsafe condition or a serious hazard, the inspector shall communicate that condition to the owner or the owner's on-site representative and shall report the findings immediately to the building official so that the building official can make a final determination of whether the violation constitutes a serious hazard which requires the issuance of an adjudication order as required in section 109.*

**108.6.4 Industrialized units, observations of noncompliance.** *When an inspector from the department having jurisdiction finds that an industrialized unit has been constructed contrary to the plans approved by the board, the inspector shall report the nonconformance to the building official. The building official shall notify the board of all violations of section 108.2.13. The board or its designee and the building official shall determine the corrective action to be taken before the building is approved to be occupied.*

**108.7 Building official determination of noncompliance.** *The building official shall evaluate the inspector's report and render a final determination as to whether the items of non-compliance are to be communicated to the owner in the form of an adjudication order complying with section 109. The building official shall also determine whether any approvals are possible.*

**108.8 Testing of building service equipment.** *Building service equipment shall be tested as required in the applicable code or referenced standard. Advanced notice of the test schedule shall be given to the building official. The building official may require that the tests be conducted in the presence of the building official or certified inspector. Testing and inspection records shall be made available to the building official or inspector, upon request, at all times during the fabrication of the systems and the erection of the building.*

**108.8.1 New, altered, extended or repaired systems.** *New systems and parts of existing systems, which have been altered, extended, renovated or repaired, shall be tested as prescribed herein to disclose leaks and defects.*

**108.8.2 Apparatus, material and labor for tests.** Apparatus, material and labor required for testing a system or part thereof shall be furnished by the owner or the owner's representative. Required tests shall be made by the owner and shall be conducted at the expense of the owner or the owner's representative.

**108.8.3 Reinspection and testing.** Where any work or installation does not pass an initial test or inspection, the inspector shall proceed as outlined in section 108.6.

### **Section 109** **Orders, Violations, and Unsafe Buildings**

**109.1 Adjudication orders required.** When the building official denies any approval or takes action in response to findings of non-compliance, such action shall be initiated by issuing an adjudication order, prior to seeking any remedy, civil or criminal. Every adjudication order shall:

1. Clearly identify the section of law or rules violated;
  - 1.1 Clearly identify, in a contrasting and obviously marked manner, all violations related to accessibility.
2. Specifically indicate which detail, installation, site preparation, material, appliance, device, addition, alteration to structures, construction documents, assemblages or procedures are necessary to change to comply with the order;
  - 2.1 When issued to stop work, the order shall also clearly indicate the specific work that is required to cease, when the work must cease and the conditions under which the cited work will be permitted to resume. The order to stop work shall be given to the owner of the property involved, to the owner's agent and the person doing the work.
3. Include notice of the procedure for appeal and right to a hearing if requested within thirty days of the mailing of the order. The order shall also indicate that, at the hearing, the owner may be represented by counsel, present arguments or contentions orally or in writing, and present evidence and examine witnesses appearing for or against the owner;
  - 3.1 Any hearing(s) scheduled for accessibility issues shall cause the building official or the appeals board to notify a local advocate organization for

*people with disabilities of the scheduled hearing. When a local advocate organization is not available, a state organization representing people with disabilities, such as the "Governor's Council on People with Disabilities" shall be notified;*

4. *Specify a reasonable period of time in which to bring the item(s) on the order into compliance;*
5. *Include the signature of the building official;*
6. *The order shall be sent by certified mail, return receipt requested, to the owner and any individual designated as a representative or agent by the owner in such matters.*

**109.2 Response to orders.** *The person receiving an order shall exercise their right to appeal within 30 days of the mailing of the order, comply with the order, or otherwise be released from the order by the building official.*

**109.3 Prosecution and penalties.** *When an owner fails to comply with section 109.2, the owner may be prosecuted and is subject to a fine of not more than five hundred dollars as provided for in section 3791.04 of the Revised Code.*

**109.3.1 Unlawful continuance.** *Failure to cease work after receipt of an order to stop work is hereby declared a public nuisance.*

**109.4 Unsafe buildings.** *Structures or existing equipment that are unsafe or unsanitary due to inadequate means of egress facilities, inadequate light and ventilation, or which constitute a fire hazard, or are otherwise dangerous to human life, shall be deemed a serious hazard. Where a building is found to be a serious hazard, such hazard shall be eliminated or the building shall be vacated, and where such building, when vacated, remains a serious hazard, it shall be razed.*

**109.4.1 Orders, injunction proceedings.** *Where the building official finds that a building is a serious hazard and the owner of such building fails, in the time specified in an order from the building official, to eliminate such hazard, or to vacate or raze the building, the building official shall proceed under section 3781.15 of the Revised Code.*

**109.4.2 Restoration.** *Where the structure or equipment is determined to be unsafe by the building official, it is permitted to be restored to a safe*

*condition. To the extent that repairs, alterations or additions are intended to be made or a change of occupancy occurs during the restoration of the structure, such repairs, alterations, additions or change of occupancy shall comply with Chapter 34 and this chapter.*

### **Section 110** **Appeals**

**110.1 Hearing and right of appeal, local board of building appeals.** *Adjudication hearings shall be in accordance with sections 119.09 to 119.13 of the Revised Code, as required by section 3781.031 of the Revised Code, and the following:*

1. *Requests for hearing shall be within thirty days of the mailing date of an adjudication order. The local board shall schedule a hearing and notify the party. If the hearing concerns section 3781.111 of the Revised Code or rules adopted thereunder, reasonable notice of time, date, place, and subject of the hearing shall be given to any local organization composed of or representing persons with disabilities, as defined in section 3781.111 of the Revised Code, or if there is no local organization, then to any statewide organization composed of or representing persons with disabilities.*
  - 1.1 *For purposes of conducting adjudication hearings, the local board may require attendance of witnesses, production of records and papers, and may take depositions of witnesses in accordance with section 119.09 of the Revised Code.*
  - 1.2 *Testimony shall be under oath and, as outlined in section 109.1, a stenographic or mechanical record of testimony and other evidence submitted shall be taken at the expense of the local board of building appeals.*
  - 1.3 *The local board may postpone or continue any adjudication hearing on its own motion or upon the application of any party.*
  - 1.4 *The board shall keep a full and complete record of all proceedings which shall be open to public inspection.*
2. *The Board shall render its decision within thirty days after the hearing.*

3. *Following the hearing, an order shall be entered on its journal, and the local board shall serve by certified mail, return receipt requested, upon the party affected thereby, a certified copy of the order and a statement of the time and method by which an appeal may be perfected. A copy of the order shall be mailed to the attorney or other representatives of record representing the party.*
4. *Any municipal or county officer, official municipal or county board, or person who was a party to the hearing before the municipal or county board of building appeals, may apply to the state board of building appeals for a de novo hearing, or may appeal to the court of common pleas of the county in which he is a resident or in which the premises affected by such order is located.*
5. *In addition, when the adjudication hearing concerns section 3781.111 of the Revised Code, or any rule made thereunder, any local organization composed of or representing persons with disabilities, or if no local organization exists, then any statewide organization representing persons with disabilities may file appeals as indicated in paragraph 4. of this section.*
6. *Application for a de novo hearing before the state board shall be made no later than thirty days after the municipal or county board renders its decision.*

### **Section 111** **Certificate of occupancy**

**111.1 Approval required to occupy.** *No building or structure, in whole or in part, shall be used or occupied until the building official has issued an approval in the form of a certificate of occupancy. The certificate of occupancy shall indicate the conditions under which the building shall be used. The building owner shall only use the structure in compliance with the certificate of occupancy and any stated conditions. The structure and all approved building service equipment shall be maintained in accordance with the approval.*

*When a building or structure is entitled thereto, the building official shall issue a certificate of occupancy provided there are not violations of law or orders of the building official pending or as permitted in this section.*

**111.1.1 New buildings.** *A building or structure erected shall not be used or occupied, in whole or in part, until the certificate of occupancy has been issued by the building official. Occupancy of spaces within a building which are unaffected by the work shall be allowed to continue if the building official*

*determines the existing spaces can be occupied safely until the completion of the alteration.*

**111.1.2 Building alterations or additions.** *A building or structure enlarged, extended or altered, in whole or in part, shall not be occupied or used until a certificate of occupancy has been issued. Occupancy of spaces within a building which are unaffected by the work of alteration shall be allowed to continue if the building official determines the existing spaces can be occupied safely until the completion of the alteration.*

**111.1.3 Change in occupancy.** *Changes in occupancy of an existing structure shall not be made except as specified in Chapter 34. A building or structure hereafter changed, in whole or in part, from one occupancy to another shall not be occupied for the new occupancy until the certificate of occupancy has been issued by the building official reflecting such changed portions. Existing occupancy of spaces within the building which are unaffected by the change of occupancy and any related alterations shall be allowed to continue if the building official determines the existing spaces can be occupied safely until the completion of the alterations.*

**111.1.4 Partial occupancy.** *Upon the request of the owner or owner's representative, a building official shall issue a certificate of occupancy before the completion of the entire work, provided that the building official determines that the space can be safely occupied prior to full completion of the building, structure, or portion without endangering life or public welfare. The certificate shall indicate the extent of the areas approved for occupancy and any time limits for completion of the work.*

**111.1.5 Time-limited occupancy.** *A building or structure hereafter changed in part from one occupancy to another for a limited time may receive a certificate of occupancy reflecting that time-limited occupancy provided:*

- 1. There are no violations of law or orders of the building official pending;*
- 2. It is established after inspection and investigation that the proposed use is not deemed to endanger public safety and welfare safely;*
- 3. The building official has approved the use for an alternative purpose on a temporary basis;*

4. *The building official has issued a certificate of occupancy indicating any special conditions under which the building or part of the building can be used for the alternative purpose within the time limit specified.*

**111.1.6 Temporary structures occupancy.** *A building intended to be erected, placed and used for a period of time not to exceed one hundred eighty days that has been determined by the building official to be in compliance with section 102.8 shall be issued a “Certificate of Occupancy for Temporary Structures.” The building official is authorized to grant extensions for demonstrated cause.*

**111.2 Existing buildings.** *Upon written request from the owner of an existing building or structure, the building official shall issue a certificate of occupancy, provided there are not violations of law or orders of the building official pending, and it is established after inspection and investigation that the alleged occupancy of the building or structure has previously existed. This code shall not require the removal, alteration or abandonment of, or prevent the continuance of, the occupancy of a lawfully existing building or structure, unless such use is deemed to endanger public safety and welfare.*

**111.3 Certificate issued.** *The certificate shall certify compliance with the provisions of this code, Chapters 3781. and 3791. of the Revised Code, and the purpose for which the building or structure may be used in its several parts. The certificate of occupancy shall contain the following:*

1. *The plan approval application number.*
2. *The address.*
3. *A description of that portion of the structure for which the certificate is issued.*
4. *The signature of all building officials having jurisdiction. When more than one building official has jurisdiction for a building (when the certification of the building department is limited for such systems as plumbing or piping systems) each shall sign the certificate of occupancy with an indication of the scope of their individual approvals.*
5. *The edition of the code under which the plan approval was issued.*
6. *The use and occupancy, in accordance with the provisions of Chapter 3.*

7. *The type of construction as defined in Chapter 6.*
8. *The design occupant load.*
9. *If an automatic sprinkler systems is provided, whether the sprinkler system is required.*
10. *The hazard classification or storage configuration, including aisle widths, for which the automatic sprinkler system is designed.*
11. *The automatic sprinkler and standpipe system demand at the base of the riser.*
12. *Any special stipulations and conditions of the plan approval including any variances granted to the requirements of this code.*

**111.4 Validity of a certificate of occupancy.** *The certificate of occupancy represents an approval that is valid only when the building or structure is used as approved and certifies conformance with applicable provisions of the “Ohio Building Code” and Chapters 3781. and 3791. of the Revised Code. The approval is conditioned upon the building systems and equipment being maintained and tested in accordance with the approval, the “Ohio Building Code”, and applicable equipment and systems schedules.*

**111.5 Connection of service utilities.** *No connections shall be made from a utility, source of energy, fuel or power to any building or system that is regulated by this code for which a plan approval and inspections are required, until approved by the building official.*

**111.6 Temporary connection.** *The building official shall approve the temporary connection of the building or system to the utility source of energy, fuel or power.*

## **Section 112** **Changes to the code**

**112.1 Changes, board of building standards.** *The board may, on its own motion, in accordance with section 3781.10 of the Revised Code adopt, amend, or rescind rules through the administrative rule process.*

**112.2 Changes, applications for.** *Any person may apply to the board to adopt, amend, or rescind rules of the board. The application for rule change shall be on*

*forms and in format prescribed by the board. Twelve printed copies of the application shall be filed with the secretary of the board.*

**112.3 Processing applications for changes.** *When the secretary of the board receives a conforming application for an adoption, amendment, or annulment of a provision of the rules of the board, the secretary shall promptly deliver or mail a copy of the application to each member of the board.*

*After receiving an application for the adoption, amendment, or annulment of a provision of the rules of the board, the board shall proceed under sections 3781.101 and 3781.12 of the Revised Code.*

### **Section 113** **Industrialized units**

**113.1 Industrialized units.** *Industrialized units shall be approved by the board in accordance with the provisions in this section.*

#### **Exceptions:**

1. *Alternative materials, design and methods of construction and equipment approved by the board in accordance with section 114.2.*
2. *Construction for which the provisions of section 1704 applies. Where panels or components are constructed to include elements not provided for or accounted for in section 1704, then this section shall apply. (For example, engineered gluelam beams, precast concrete panels or welded steel components that have been constructed offsite with electrical or mechanical components in them so that a detailed inspection of the mechanical or electrical components cannot be done on the site of their intended use would be required to comply with this section.)*
3. *Foam plastic insulation conforming to the provisions of section 2603. (However, a foam plastic insulation panel that is constructed, listed and labeled in accordance with section 2603, is required to comply with this section if structural, electrical or other components not covered by section 2603 are enclosed within the panel).*
4. *Materials, devices and products in directories listed in Table 114.3 used for building service equipment systems in accordance with the listing and this code.*

### ***113.2 Definitions.***

***Closed construction.*** An assembly of materials or products manufactured in such a manner that its structural, plumbing, electrical, environmental control, or fire protection elements or components are concealed and are not readily accessible for inspection at the site of its erection, without disassembly, damage, or destruction. Closed construction includes assemblies where only one of the components is not accessible for inspection. (For example, an equipment enclosure where all the electrical conductors and components are exposed for inspection and its roof and wall panels have exposed structural members but the floor panel structural members are not exposed, would be required to comply with this section.)

***Industrialized units.*** Industrialized units are prefabricated components comprised of closed construction manufactured at a location remote from the site of intended use and transported to a building site for its subsequent use. Industrialized units are not restricted to housing for one-, two-, and three-family dwellings, but includes all prefabricated forms of building elements and assembled construction units, intended for both structural and service equipment purposes in all buildings of all groups. Prefabricated shop assemblies may be shipped in structurally complete units ready for installation in the building structure or in knock-down and packaged form for assembly at the site.

***113.2.1 General terms.*** Such terms as heart modules or cores, modules, modulars, service cores, prefabs, sectional or sectionalized, panels or panelized construction, and specific terms including "prefabricated-subassembly, -building, -unit, -unit service equipment" shall be considered industrialized units. They may be self-sufficient or interdependent as a unit or group of units and used together or incorporated with standard construction methods to form a completed structural entity.

***113.3 Application.*** The application for approval, including revisions and renewals for existing approvals, shall be submitted to the board together with the fee required in section 113.8 of this chapter. The required information shall be provided as prescribed by the board on its website. Construction documents shall be included in conformity with the applicable provisions of section 106, and shall describe all essential elements of the structure or assembly and details of interconnection of: assemblies; service equipment; electrical wiring; plumbing; mechanical; and any other equipment whether installed at the site or in the

*manufacturing facility. The design and construction of the units shall be in conformance with the provisions of the Ohio building, mechanical and plumbing codes based on the intended use and/or occupancy type. Industrialized units intended to be used exclusively for one-, two-, or three- family dwellings shall comply with the applicable provisions of the “Residential Code of Ohio for One-, Two-, and Three- Family Dwellings” listed in section 3501.2 or shall meet the provisions of the board’s rules applicable to “Group R-3”. Only the person holding an approval may apply to the board for a revision or renewal of the approval.*

***113.3.1 Manufacturers with facilities outside Ohio.*** *Each application for manufacturers with manufacturing facilities outside Ohio shall also identify the individual or agency that will be performing in-plant inspections of the units intended for placement in Ohio. The application shall also include a letter from the designated individual or agency indicating that they have a contractual relationship with the manufacturer to perform the inspections. This letter shall include the name(s) and board certification(s) of the individual(s) who will be assigned to perform the inspections.*

***113.3.2 Manufacturers with facilities in Ohio.*** *Each application for manufacturers with manufacturing facilities in Ohio shall include the same information required in section 113.3.1 or, as an alternative, the manufacturer shall indicate their intention to have the inspections conducted by inspectors designated by the board.*

***113.4 Evaluation.*** *After receipt of the application, the board or such agency designated by the board shall proceed with review of the industrialized unit construction documents and cause such inspections of the manufacturer's quality control processes used to ensure compliance with the rules of the board.*

***113.4.1 Tests.*** *The board shall have the authority to require tests as evidence of compliance. 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 board shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the board for the period required for retention of public records.*

***113.4.2 Plant evaluations.*** *An initial plant evaluation inspection shall be required at each plant of manufacture to observe and ensure that the manufacturer's facilities and quality control program maintains acceptable control of materials and processes used in the manufacture of industrialized*

*units to ensure conformance with the approved construction documents. The plant evaluation inspection shall include all subassembly plants supplying the manufacturer, as the board may deem necessary.*

**113.5 Approval.** *The board, upon determination of compliance, shall issue an approval to the applicant. Industrialized units approved by the board may be used anywhere in Ohio subject to the conditions for their use and application as indicated in the approval.*

**113.5.1 Revisions.** *Any changes to board approved construction documents affecting the conditions listed in the approval shall require a revision of the approval.*

**113.5.2 Code changes.** *When any changes to the rules of the board are adopted which affect the use, safety or sanitation of any approved industrialized unit, the holder of the approval shall apply to the board for a revision of the approval. Failure to apply for revision of approvals within the time specified by the board, shall constitute failure to comply with the conditions of the approval.*

**113.5.3 Revocation of approval.** *Upon failure of the holder of an approval to comply with the conditions of the approval and this chapter, the board, on its own motion, shall order a hearing in accordance with section 119.03 of the Revised Code to revoke an existing approval.*

**113.6 Inspections and insignia.** *Each industrialized unit shall be inspected during each phase of the manufacturing process by inspectors certified by the board or such persons designated by the board until inspections demonstrate that the manufacturer's quality control program is capable of assuring that the industrialized units produced are built in accordance with the construction documents approved by the board. When it has been determined that the manufacturer's quality control program is capable of assuring compliance with the board approved construction documents, at least one phase of construction shall be inspected for each unit by an inspector certified or designated by the board.*

**Exception:** *When a manufacturer with manufacturing facilities in Ohio has chosen to have inspections conducted by designees of the board, the inspection frequency shall be based upon the reliability or effectiveness of the manufacturer in maintaining sufficient control of the materials and processes to ensure that the units are constructed in accordance with the approved*

*construction documents.*

*An insignia shall be obtained from the board for each industrialized unit module to be used within the state of Ohio. The insignia shall be affixed to each unit after a determination is made that the unit is constructed in accordance with the construction documents approved by the board, which shall constitute final approval of the unit.*

**113.6.1 Increased inspection.** *When an inspection determines that the quality control program does not sufficiently ensure compliance with the construction documents approved by the board, the certified inspector or person designated by the board shall, by written notification, inform the manufacturer that the inspection frequency will be increased so that each assembly or component affected by the nonconforming item will be inspected. These inspections shall continue until an inspection determines that the manufacturer's control of the materials and processes used is sufficient to ensure that the units are constructed in accordance with the approved construction documents.*

**113.7 Manufacturer responsibility.** *The manufacturer shall maintain responsibility over all work completed in the factory until the unit is approved for first occupancy and shall rectify any deviations from the approved construction documents, which are found either in the field or at the place of manufacture. The manufacturer shall submit to the board such periodic reports, notifications and information as required by board procedures.*

**113.7.1 Document submission to building departments.** *The manufacturer shall ensure that the construction documents approved by the board are presented to the building official in accordance with section 106.1.2(1) before placing the industrialized unit on site.*

**Exception:** *Industrialized units construction documents previously approved by the board and site related construction documents are not required to be submitted to the division of industrial compliance where industrialized units are used exclusively as one-, two-, or three family dwellings.*

**113.7.2 Change in personnel.** *Whenever there are changes in company name, ownership, subsidiary status, address or change in the manufacturer's management personnel who are responsible for making policy concerning quality control, the manufacturer shall immediately notify the board, in*

*writing, and the manufacturing plant(s) affected by the change will be subject to a plant evaluation inspection.*

**113.8 Fees.** *All costs associated with industrialized unit approval applications, processing, construction document review, inspections and insignias shall be in accordance with sections 113.8.1 to 113.8.5.*

**113.8.1 Applications.** *Each initial application or revision submittal to the board shall be accompanied by a nonrefundable fees, designated by the board to include: application processing fee; one-hour minimum plan review fee; and other costs, when incurred, such as mailing and check processing.*

**113.8.2 Evaluation of construction documents.** *All costs of application processing, evaluation of construction documents or other documentation submitted to the board shall be paid by the applicant.*

**113.8.3 Plant evaluation and inspection costs.** *All costs of plant evaluations and inspections shall be paid by the manufacturer of the unit including travel, food, lodging, and administrative costs.*

**113.8.4 Insignias.** *The fee for insignia for all assembled modular units manufactured for use in the state of Ohio shall be fifty dollars per unit (any preassembled combination of walls to floor, ceilings, roof, and other such components).*

*The fee for insignia for all panelized units manufactured for use in the state of Ohio shall be one dollar for each twenty square feet of surface area of preassembled individual components (wall, floor, ceiling or roof sections, and other such components) intended to be shipped to the site and attached to other components at the site of intended use.*

**113.8.5 Tests.** *Tests required by the board to be performed to determine compliance pursuant to section 113.4.1, shall be conducted at no expense to the board. Costs associated with any required testing or research necessary to provide evidence of compliance shall be the responsibility of the applicant.*

## **Section 114**

### **Products and materials**

**114.1 Approved materials, products, assemblies and methods of construction.** *Materials, products, assemblies and methods of construction approved by the*

*building official shall be constructed and installed in accordance with such approval. Materials, devices, products and assemblies listed in directories indicated in Table 114.3 are authorized for use in accordance with all of the following:*

- 1. Approved by the building official;*
- 2. Installed/used in accordance with the listing;*
- 3. When used as an assembly, installed/used in compliance with this code;*
- 4. The listing is current;*
- 5. The extent of the listing does not include in its scope, elements of design, construction or installation otherwise in conflict with the provisions of this code such as fire-resistance, structural design, etc.*

***114.1.1 Definitions.*** *The following words and terms shall, for the purposes of this section, have the meanings shown herein:*

***Assembly.*** *A preassembled grouping of materials, products and/or devices designed to act as a whole. This does not include industrialized units regulated by section 113.*

***Insignia.*** *A mark or label prescribed in accordance with board procedures.*

***Material.*** *A manufactured form or substance designed to act as a whole.*

***Method of construction.*** *A procedure or system intended to result in a finished building, structure or portion thereof.*

***Product.*** *A material or device designed and manufactured to perform a predetermined function. Appliances, assemblies and equipment are also considered products.*

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

**114.2 Alternative materials, products, assemblies and methods of construction.**

The provisions of this code are not intended to prevent the installation of any material or to prohibit any material, product, assembly or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, product or method of construction shall be approved in accordance with either section 114.2.1 or section 114.2.2.

**Exception:** Industrialized units constructed in accordance with section 113.1 of this chapter.

**114.2.1 Research reports and listings.** Any material, product, assembly or method of construction not specifically provided for in this code, shall have a valid research report or listing from an evaluation service ~~listed in “Appendix P”~~ and recognized by the board and published on a list titled “Approved National Evaluation and Accreditation Services” found on the board’s website. The alternative material, product, assembly, or method of construction shall be deemed to be approved provided it complies with the conditions listed in the research report or listing and Chapters 3781. and 3791. of the Revised Code.

**114.2.2 Board approval.** Any material, product, assembly or method of construction not specifically provided for in this code may be approved by the board of building standards upon application under the procedures prescribed by the board.

**114.2.2.1 Application.** The application for approval including revisions and renewals for existing approvals shall be submitted in two copies to the secretary of the board together with the fee required in section 114.2.2.11 of this chapter. The required information shall be on forms prescribed by the board. Construction documents in conformance with the applicable provisions of section 106 shall be included to adequately describe and show how equivalent compliance is achieved. Only the person holding an approval issued by the board may apply for a revision or renewal of the approval.

**114.2.2.2 Evaluation.** The board, upon receipt and evaluation of the completed application, shall have the authority to require such additional information as necessary to determine compliance with the requirements of this section.

**114.2.2.3 Tests.** The board shall have the authority to require tests as

*evidence of compliance to be made at no expense to the board. 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 board shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the board for the period required for retention of public records.*

**114.2.2.4 Approval process.** *When the board deems it advisable to permit the use of an alternative material, product, or method of construction, a public hearing shall be conducted in accordance with section 119.03 of the Revised Code. After such hearing, the board shall set an effective date and issue an approval for its use.*

**114.2.2.5 Conditions of approval.** *The approval of the alternative material, product, assembly or method of construction issued by the board constitutes an authorization for its use anywhere in Ohio subject to the conditions for its use and application as indicated in the approval. An insignia shall be affixed to each material, product and assembly after it is determined that it is constructed in accordance with the construction documents approved by the board. A certificate shall be issued for each approved method of construction. The approval for use is valid for a period of one year after the effective date established by the board.*

**114.2.2.6 Revisions.** *Any changes to an approved alternative material, product, assembly or method of construction affecting the conditions listed in the approval shall require approval by the Board.*

**114.2.2.7 Renewals.** *In order to retain the approval, the holder shall apply to the board for a renewal on an annual basis.*

**114.2.2.8 Code changes.** *When any changes to the rules of the board are adopted which affect the use, safety or sanitation of any approved alternative material, product, assembly or method of construction, the holder of such approval shall apply to the board for a revision of the approval. Failure to apply for revision of approvals within three months of the effective date of such rule changes shall constitute failure to comply with the conditions of the approval.*

**114.2.2.9 Compliance.** *After approval, each holder of an approval is required to maintain acceptable control of the materials and processes used in the manufacture of an approved alternative material, product,*

*assembly or method of construction as a condition of the approval. The board or its designee shall have the right to make inspections at the place of manufacture to observe compliance. Each holder of an approval shall maintain responsibility over all work completed in their manufacturing facilities until the approved material, product and assembly is installed for initial use and shall rectify any deviations from the approved construction documents and other defects found either in the field or at the place of manufacture. The manufacturer shall submit to the board such periodic reports, notifications and information as required by board procedures. The holder of an approval shall be required to pay all associated expenses incurred by the board or its designee.*

**114.2.2.10 Revocation of approval.** *Whenever an approved alternative material, product, assembly or method of construction fails to comply with the conditions of the approval and this chapter, the board, upon its own motion, shall order a hearing in accordance with section 119.03 of the Revised Code to revoke an existing approval.*

**114.2.2.11 Fees.** *Fees for approved alternative materials, products, assemblies and methods of construction shall be in accordance with sections 114.2.2.11.1 to 114.2.2.11.6.*

**114.2.2.11.1 New application.** *An application for approval shall be accompanied by a nonrefundable processing fee of one hundred dollars, and the applicant shall bear the cost of the evaluation.*

**114.2.2.11.2 Code changes.** *An application to modify an existing approval due to code changes under section 114.2.2.8 shall not require a processing fee; however, the applicant shall bear the cost of the evaluation.*

**114.2.2.11.3 Revisions.** *An application to revise an existing approval shall require a nonrefundable processing fee of one hundred dollars and the applicant shall bear the cost of the evaluation.*

**114.2.2.11.4 Renewals** *An application to revise an existing approval shall require a nonrefundable processing fee of one hundred dollars. The renewal application shall be received by the board within thirty days after the end of each calendar year.*

**114.2.2.11.5 Tests.** *Tests required by the board to be performed to*

determine compliance pursuant to section 114.2.2.3, shall be conducted at no expense to the board. Costs associated with any required testing or research necessary to provide evidence of compliance shall be the responsibility of the applicant.

**114.2.2.11.6 Unit fee.** The fee for insignias for each material, product and assembly manufactured for use in the state of Ohio shall be one dollar per unit.

The fee for a certificate for each method of construction in the state of Ohio shall be one thousand dollars.

**114.3 Materials, products and assembly directories.** “Table 114.3” lists directories for materials, products and assemblies accepted for specified performances.

**Table 114.3**

<b>Title</b>	<b>Agency</b>	<b>Edition<sup>6</sup></b>
<i>Building Materials Directory</i>	UL	2009
<i>Electrical Appliances and Utilization Equipment Directory</i>	UL	2008
<i>Electrical Construction Materials Directory</i>	UL	2008
<i>Fire Protection Equipment Directory</i>	UL	2009
<i>Fire Resistance Directory Vols. 1, 2A, 2B, and 3</i>	UL	2009
<i>Flammable and Combustible Liquids and Gases Equipment Directory</i>	UL	2008
<i>Hazardous Location Equipment Directory</i>	UL	2008
<i>CSA Website - <a href="http://directories.csa-international.org/">http://directories.csa-international.org/</a></i>	CSA <sup>1,4</sup>	N/A
<i>Intertek ETL <a href="http://www.intertek-etlsemko.com">www.intertek-etlsemko.com</a></i>	Intertek <sup>2</sup>	N/A
<i>Approval Guide <a href="http://www.approvalguide.com">www.approvalguide.com</a></i>	FM <sup>5</sup>	N/A
<i>Fire Resistance Design Manual (GA-600- 18th ed.)</i>	GA <sup>3</sup>	2006

Footnotes:

1. Canadian Standards Association or CSA International (formerly AGA)
2. Website only – Select “ETL Listed Directory or WH&OPL Mark Directory”
3. Gypsum Association
4. Website only – Select “Gas Appliances.”
5. Website only – free registration

## **Section 115**

### **Construction documents examination and inspection fees**

**115.1 Payment of fees.** Fees for construction documents submitted to and inspections made by certified building departments shall be in accordance with

*the locally adopted fee schedule.*

**115.2 Schedule of fees.** *The fees for examination and processing of construction documents when required to be submitted to the division of industrial compliance, except medical gas piping systems, shall be in accordance with Table 115.2. The filing process for an application for plan approval specified in section 107.2 will not be considered complete until the applicable fees have been paid in accordance with table 115.2.*

**Exception:** *Fees for alteration or change of occupancy as determined by the building official shall be based on the actual area affected by the alteration or change of occupancy which may extend beyond the limits of construction.*

**115.2.1 Additional inspections.** *The division of industrial compliance may establish a written policy for the maximum number of inspections required by sections 108.2 and 105.1.5 that may be included in the fees set forth in Table 115.2. Inspections in excess of the maximum number established by the division of industrial compliance shall be subject to fee of one hundred fifty dollars per inspection.*

**115.2.2 Resubmissions.** *The fees set forth in Table 115.2 shall include one initial plan review and up to two resubmission plan reviews to resolve issues resulting from correction letters. The fee for plan review after the second resubmission shall be of one hundred dollars for each additional resubmission.*

**115.2.3 Re-stamping.** *The processing fee for re-stamping additional sets of construction documents after initial plan approval shall be one hundred dollars.*

**115.2.4 Amended construction documents.** *The processing fee for amended construction documents submitted to the division of industrial compliance in accordance with section 106.3 shall be two hundred fifty dollars. The fee for plans examination of amended construction documents submitted to the division of industrial compliance in accordance with section 106.3 shall be one hundred dollars per hour for each submission.*

**115.2.5 Phased plan approval.** *The fees for plan examination and processing of a phased plan approval request per section 105.1.4 shall be in accordance with Table 115.2 and section 115.2.1 for the initial phase submission of each scope of work. The processing fee for plan examination of each subsequent*

*phase of submission shall be two hundred fifty dollars.*

**Table 115.2**

<b>Scope of Work</b>	<b>Processing Fee</b>	<b>Fee for Plans Examination and a minimum of Five Inspections</b>
<i>(1) Structural</i>	\$250.00	\$9.50/100 sq. ft. gross area of each floor level
<i>(2) Mechanical</i>	\$250.00	\$5.75/100 sq. ft. gross area of each floor level
<i>(3) Electrical</i>	\$250.00	\$5.75/100 sq. ft. gross area of each floor level
<i>(4) Fire alarm systems</i>	\$250.00	\$5.75 per device
<i>(5) Automatic sprinkler and other fire suppression systems (all suppressed areas)</i>	\$250.00	\$5.75/100 sq. ft. gross area of each floor level
<i>(6) Industrial unit</i>	\$200.00	\$1.75/100 sq. ft. gross area of each floor level

**115.3 Medical gas piping systems.** *The fees for examination and processing of construction documents for medical gas piping systems when required to be submitted to the division of industrial compliance shall be in accordance with Table 115.3.*

**115.3.1 Additional inspections.** *The division of industrial compliance may establish a written policy for the maximum number of inspections required by sections 104.4 and 105.1 that may be included in the fees set forth in Table 115.3 for medical gas piping systems. Inspections in excess of the maximum number established by the division of industrial compliance shall be subject to a fee of one hundred fifty dollars per inspection.*

**Table 115.3**

<b>Medical Gas Piping System Processing, Plans Examination, and Inspections</b>	<b>Fee (includes a minimum of two inspections)</b>
<i>Processing</i>	\$250.00
<i>Plans Examination</i>	\$250.00
<i>Per room (with outlets) and equipment rooms</i>	\$10.00
<i>Per zone valve assembly</i>	\$25.00

<i>Per system</i>	<i>\$25.00</i>
<i>Per “tie-in”</i>	<i>\$25.00</i>

**115.4 Preliminary review.** *The fee for preliminary construction document examination for the purpose of determining compliance with the provisions of the rules of the board by the division of industrial compliance shall be one hundred thirty dollars per hour.*

**115.5 Inspection fees.** *The fee for each inspection, other than those required by section 108.2 and 105.1.5 shall be two hundred twenty-five dollars per inspection. Requests for all inspections shall be in writing to the division of industrial compliance and the fee shall be paid prior to the inspection.*

*Fees for an application pursuant to section 105.1.5 shall include a processing fee of one hundred fifty dollars. The fee for periodic inspections conducted by the division of industrial compliance shall include the hourly inspection rate and expenses such as food, lodging, and administrative costs. All such fees shall be paid by the holder of an annual approval.*

**115.6 Reinspection fee.** *The fee for each reinspection shall be one hundred fifty dollars. A reinspection shall be required when the inspector must return to inspect work that was not ready or had failed a previous inspection.*

**115.7 Related fees.** *In addition to the fees required by sections 115.2, 115.3 and 115.4, the superintendent of the division of industrial compliance shall collect a fee, on behalf of the board of building standards, of three dollars and twenty-five cents for each application for acceptance and approval of construction documents and for making inspections.*

*The fee shall be deposited by the division of industrial compliance, pursuant to section 121.084 of the Revised Code, to the credit of the board. The superintendent of the division shall report on the amount of the fees collected and deposited to the credit of the board not later than forty-five days following the end of the first full month’s collection and then monthly afterward.*

**115.8 Late fee.** *Any person who fails to pay an inspection fee required for any inspection conducted by the department of commerce pursuant to Chapters 3781. and 3791. of the Revised Code, except for fees charged for the examination and processing of construction documents, within forty-five days after the inspection is conducted shall pay a late payment fee equal to twenty-five per cent of the inspection fee.*

**115.9 Certificate of occupancy.** *The fee for each certificate of occupancy issued in accordance with section 111 shall be sixty-five-dollars.*

**115.10 Annual approval for alterations.** *The fee for each annual approval for an individual applicant issued in accordance with section 105.1.5 shall be six hundred fifty dollars.*

**115.11 Welding and brazing procedure specification review.** *The fee for the review of each piping welding and brazing specification submitted in accordance with section 313.5 of the mechanical code and section 315.5 of the plumbing code shall be sixty dollars.*

**115.12 Welding and brazing procedure qualification record review.** *The fee for the review of each procedure qualification record submitted in accordance with section 313.5 of the mechanical code and section 315.5 of the plumbing code shall be fifteen dollars.*

**115.13 Welding and brazing performance qualification review.** *The fee for the review of each performance qualification submitted in accordance with section 313.5 of the mechanical code and section 315.5 of the plumbing code shall be fifteen dollars.*

## **Section 116** **Board Committees Organization**

### **116.1 Meetings.**

**1. Meeting schedule.** *No later than December thirty-first of each year, the board shall establish a schedule of the dates, times, and locations of all regular board meetings and meetings of board committees for the following calendar year. Such schedule shall be posted on the board's website: <http://www.com.ohio.gov/dico/BBS.aspx>.*

**2. Meeting location.** *All meetings of the board shall be held in offices of the Ohio department of commerce, training room #1, 6606 Tussing Rd., Reynoldsburg, Ohio, 43068, unless otherwise designated.*

**116.2 Notices.** *Prior to all regular or special meetings of the board, the executive secretary shall distribute the agenda, including meeting date, time, and location, by electronic mail to any person who has requested such information.*

**116.3 Rules.** *All rules of the board shall be adopted in accordance with Chapter 119. of the Revised Code.*

**116.4 Board Committees** *and duties.* ~~The Board~~ board shall have three standing committees.

1. **Code Committee**. ~~The Code Committee~~ code committee provides general oversight of the ~~Board's~~ board's rule promulgation and code development activities. The committee reviews proposed rule changes and petitions for code changes and shall make recommendations to the ~~Board~~ board for action.

2. **Education Committee**. ~~The Education Committee~~ education committee provides general oversight to the ~~Board's~~ board's continuing education program. The ~~Committee~~ committee reviews continuing education course applications submitted for approval pursuant to ~~section 103.3.9~~ paragraph (G) of rule 4101:7-3-01 of the Administrative Code and shall make recommendations to the ~~Board~~ board for action on the applications.

3. **Certification Committee**. ~~The Certification Committee~~ certification committee provides general oversight to the ~~Board's~~ board's personnel and building department certification program. The ~~Committee~~ committee reviews personnel and building department certification applications submitted for approval pursuant to ~~section 103~~ paragraph (G) of rule 4101:7-3-01 of the Administrative Code and shall make recommendations to the ~~Board~~ board for action on the applications.

Effective: 03/01/2013  
R.C. 119.032 review dates: 11/01/2016

CERTIFIED ELECTRONICALLY

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Certification

02/08/2013

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Date

Promulgated Under: 119.03  
Statutory Authority: 3781.10(A), 4104.43(A0(1))  
Rule Amplifies: 2744., 3781.03, 3781.031, 3781.10, 3781.11, 3791.04  
Prior Effective Dates: 7/7/69, 4/15/74, 2/15/75, 7/1/77, 12/30/77, 7/1/78,  
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1/1/83, 1/1/84, 3/1/84, 3/5/84, 3/1/85, 7/1/85, 12/1/85,  
3/1/86, 9/1/86, 7/1/87, 1/1/88, 10/1/88, 1/1/89, 1/1/90,  
8/1/90, 10/1/90, 7/1/91, 7/15/92, 9/1/92, 1/1/93,  
7/5/93, 1/1/94, 9/1/94, 5/15/95, 7/1/95, 2/1/96, 2/2/96,  
1/1/97, 7/1/97, 1/1/98, 3/1/98, 4/1/99, 10/1/99,  
7/15/00, 12/1/00, 4/1/01, 1/1/02, 7/1/02, 1/1/03,  
4/1/03, 7/1/03, 8/15/03, 1/1/04, 7/1/04, 3/1/05, 9/6/05,  
3/1/06, 7/1/06, 7/1/07, 1/1/09, 7/1/09, 11/1/11,  
3/11/12, 3/12/12(Emer.), 6/8/12

**4101:1-4-01 Special detailed requirements based on use and occupancy.**

*[Comment: When a reference is made within this rule to a federal statutory provision, an industry consensus standard, or any other technical publication, the specific date and title of the publication as well as the name and address of the promulgating agency are listed in rule 4101:1-35-01 of the Administrative Code. The application of the referenced standards shall be limited and as prescribed in section 102.5 of rule 4101:1-1-01 of the Administrative Code.]*

**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.

**SECTION 402  
COVERED MALL AND OPEN 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.

**402.2 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. The term "covered mall

building” shall include open mall buildings as defined below.

**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. The term “mall” shall include open malls as defined below.

**Open mall.** An unroofed common pedestrian way serving a number of tenants not exceeding three levels. Circulation at levels above grade shall be permitted to include open exterior balconies leading to exits discharging at grade.

**Open mall building.** Several structures housing a number of tenants, such as retail stores, drinking and dining establishments, entertainment and amusement facilities, offices, and other similar uses, wherein two or more tenants have a main entrance into one or more open malls. For the purpose of Chapter 4 of *this code*, anchor buildings are not considered as a part of the open 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.

**402.3 Lease plan.** Each covered mall building owner shall provide both the building and fire departments with a lease plan, *to the extent known*, showing the location of each occupancy and its exits *before* the certificate of occupancy has been issued. *As a condition of the certificate of occupancy, such plans shall be kept current by the owner.* 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.

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

where:

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

*GLA* = The gross leasable area (square feet).

**Exception:** Tenant spaces attached to a covered mall building but with a means of egress system that is totally independent of the covered mall building shall not be considered as gross leasable area for determining the required means of egress for the covered mall building.

**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 715.4.8.3.

**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 barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. The minimum fire protection rating of openings in the fire barriers shall be 1 hour.

**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.

**402.5.2 Minimum width open mall.** The minimum floor and roof opening width above grade shall be 20 feet (9096 mm) in open malls.

**402.6 Types of construction.** The area of any covered mall building, including anchor buildings, of Types 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 above grade plane. The allowable height and area of anchor buildings greater than three

stories above grade plane 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.

**402.6.1 Reduced open space.** The permanent open space of 60 feet (18 288 mm) 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 covered mall building and anchor buildings.
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.
4. Group E, H, I or R occupancies are not within the covered mall building or anchor stores.

**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 not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

**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 that 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 709. 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 706.

**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 707.

**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.

**402.8 Interior finish.** Interior wall and ceiling finishes within the mall and exits shall have a minimum flame spread index and smoke-developed index of Class B in accordance with Chapter

8. Interior floor finishes shall meet the requirements of Section 804.

**402.9 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 alternative 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 406.3.

**402.9.1 Standpipe system.** The covered mall building shall be equipped throughout with a standpipe system as required by Section 905.3.3.

**402.10 Smoke control.** Where a covered mall building contains an atrium, a smoke control system shall be provided in accordance with Section 404.5.

**Exception:** A smoke control system is not required in covered mall buildings when an atrium connects only two stories.

**402.11 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 100 kilowatts (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 or UL 723.
- 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 m<sup>2</sup>).

**402.12 Children's playground structures.** Structures intended as children's playgrounds that exceed 10 feet (3048 mm) in height and 150 square feet (14 m<sup>2</sup>) in area shall comply with Sections 402.12.1 through 402.12.4.

**402.12.1 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 kilowatts 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) exhibiting a peak rate of heat release not exceeding 400 kW/m<sup>2</sup> when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m<sup>2</sup> in the horizontal orientation at a thickness of 6 mm.
7. Ball pool balls, used in soft-contained play equipment structures, having a maximum heat-release rate not greater than 100 kilowatts 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.

**402.12.2 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.

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

**402.12.4 Area limits.** Children's playground structures shall not exceed 300 square feet ( $28 \text{ m}^2$ ) in area, unless a special investigation has demonstrated adequate fire safety.

**402.13 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.

**402.14 Standby power.** Covered mall buildings exceeding 50,000 square feet ( $4645 \text{ m}^2$ ) shall be provided with standby power systems that are capable of operating the emergency voice/alarm communication system.

**402.15 Emergency voice/alarm communication system.** Covered mall buildings exceeding 50,000 square feet ( $4645 \text{ m}^2$ ) 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 907.5.2.2.

**402.16 Plastic signs.** Plastic signs affixed to the storefront of any tenant space facing the mall shall be limited as specified in Sections 402.16.1 through 402.16.5.2.

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

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

**402.16.3 Location.** Plastic signs shall be located a minimum distance of 18

inches (457 mm) from adjacent tenants.

**402.16.4 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 UL 723 or meet the acceptance criteria of Section 803.1.2.1 when tested in accordance with NFPA 286

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

**402.16.5 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 402.16 shall not be required to comply with the flame spread and smoke-developed indexes specified in Section 2603.3.

**402.16.5.1 Density.** The minimum density of foam plastics used in signs shall not be less than 20 pounds per cubic foot (pcf) (320 kg/m<sup>3</sup>).

**402.16.5.2 Thickness.** The thickness of foam plastic signs shall not be greater than ½ inch (12.7 mm).

**402.17 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.** High-rise buildings shall comply with Sections 403.2 through 403.6.

**Exception:** The provisions of Sections 403.2 through 403.6 shall not apply to the following buildings and structures:

- 1 Airport traffic control towers in accordance with Section 412.3.
- 2 Open parking garages in accordance with Section 406.3.
- 3 Buildings with a Group A-5 occupancy in accordance with Section 303.1.
- 4 Special industrial occupancies in accordance with Section 503.1.1.

5 Buildings with a Group H-1, H-2 or H-3 occupancy in accordance with Section 415.

**403.2 Construction.** The construction of high-rise buildings shall comply with the provisions of Sections 403.2.1 through 403.2.4.

**403.2.1 Reduction in fire-resistance rating.** The fire-resistance-rating reductions listed in Sections 403.2.1.1 and 403.2.1.2 shall be allowed in buildings that have sprinkler control valves equipped with supervisory initiating devices and water-flow initiating devices for each floor.

**403.2.1.1 Type of construction.** The following reductions in the minimum fire-resistance rating of the building elements in Table 601 shall be permitted as follows:

1. For buildings not greater than 420 feet (128 m) in building height, the fire-resistance rating of the building elements in Type IA construction shall be permitted to be reduced to the minimum fire-resistance ratings for the building elements in Type IB.

**Exception:** The required fire-resistance rating of columns supporting floors shall not be permitted to be reduced.

2. In other than Group F-1, M and S-1 occupancies, the fire-resistance rating of the building elements in Type IB construction shall be permitted to be reduced to the fire-resistance ratings in Type IIA.
3. The building height and building area limitations of a building containing building elements with reduced fire-resistance ratings shall be permitted to be the same as the building without such reductions.

**403.2.1.2 Shaft enclosures.** For buildings not greater than 420 feet (128 m) in building height, the required fire-resistance rating of the fire barriers enclosing vertical shafts, other than exit enclosures and elevator hoistway enclosures, is permitted to be reduced to 1 hour where automatic sprinklers are installed within the shafts at the top and at alternate floor levels.

**403.2.2 Seismic considerations.** For seismic considerations, see Chapter 16.

**403.2.3 Structural integrity of exit enclosures and elevator hoistway enclosures.** For high-rise buildings of occupancy category III or IV in accordance with Section 1604.5, and for all buildings that are more than 420 feet (128 m) in building height, exit enclosures and elevator hoistway enclosures shall comply with Sections 403.2.3.1 through 403.2.3.4.

**403.2.3.1 Wall assembly.** The wall assemblies making up the exit enclosures

and elevator hoistway enclosures shall meet or exceed Soft Body Impact Classification Level 2 as measured by the test method described in ASTM C 1629/C 1629M.

**403.2.3.2 Wall assembly materials.** The face of the wall assemblies making up the exit enclosures and elevator hoistway enclosures that are not exposed to the interior of the exit enclosure or elevator hoistway enclosure shall be constructed in accordance with one of the following methods:

1. The wall assembly shall incorporate not less than two layers of impact-resistant construction board each of which meets or exceeds Hard Body Impact Classification Level 2 as measured by the test method described in ASTM C 1629/C 1629M.
2. The wall assembly shall incorporate not less than one layer of impact-resistant construction material that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C 1629/C 1629M.
3. The wall assembly incorporates multiple layers of any material, tested in tandem, that meet or exceed Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C 1629/C 1629M.

**403.2.3.3 Concrete and masonry walls.** Concrete or masonry walls shall be deemed to satisfy the requirements of Sections 403.2.3.1 and 403.2.3.2.

**403.2.3.4 Other wall assemblies.** Any other wall assembly that provides impact resistance equivalent to that required by Sections 403.2.3.1 and 403.2.3.2 for Hard Body Impact Classification Level 3, as measured by the test method described in ASTM C 1629/C 1629M, shall be permitted.

**403.2.4 Sprayed fire-resistant materials (SFRM).** The bond strength of the SFRM installed throughout the building shall be in accordance with Table 403.2.4.

**TABLE 403.2.4**  
**MINIMUM BOND STRENGTH**

HEIGHT OF BUILDING <sup>a</sup>	SFRM MINIMUM BOND STRENGTH
Up to 420 feet	430 psf
Greater than 420 feet	1,000 psf

For SI: 1 foot = 304.8 mm, 1 pound per square foot (psf) = 0.0479 kW/m<sup>2</sup>.

a. Above the lowest level of fire department vehicle access.

**403.3 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 not less than 1-hour fire barriers constructed in accordance with Section 707 or not less than 2-hour horizontal assemblies constructed in accordance with Section 712, or both.

**403.3.1 Number of sprinkler risers and system design.** Each sprinkler system zone in buildings that are more than 420 feet (128 m) in building height shall be supplied by a minimum of two risers. Each riser shall supply sprinklers on alternate floors. If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.

**403.3.1.1 Riser location.** Sprinkler risers shall be placed in exit enclosures that are remotely located in accordance with Section 1015.2.

**403.3.1.2 Water supply to required fire pumps.** Required fire pumps shall be supplied by connections to a minimum of two water mains located in different streets. Separate supply piping shall be provided between each connection to the water main and the pumps. Each connection and the supply piping between the connection and the pumps shall be sized to supply the flow and pressure required for the pumps to operate.

**Exception:** Two connections to the same main shall be permitted provided the main is valved such that an interruption can be isolated so that the water supply will continue without interruption through at least one of the connections.

**403.4 Emergency systems.** The detection, alarm and emergency systems of high-rise buildings shall comply with Sections 403.4.1 through 403.4.8.

**403.4.1 Smoke detection.** Smoke detection shall be provided in accordance with Section 907.2.13.1.

**403.4.2 Fire alarms systems.** A fire alarm system shall be provided in

accordance with Section 907.2.13.

**403.4.3 Emergency voice/alarm communication system.** An emergency voice/alarm communication system shall be provided in accordance with Section 907.5.2.2.

**403.4.4 Emergency responder radio coverage.** Emergency responder radio coverage shall be provided in accordance with Section 510 of the *fire code*.

**403.4.5 Fire command.** A fire command center complying with Section 911 shall be provided in a location approved by the fire department.

**403.4.6 Smoke removal.** To facilitate smoke removal in post-fire salvage and overhaul operations, buildings and structures shall be equipped with natural or mechanical ventilation for removal of products of combustion in accordance with one of the following:

1. Easily identifiable, manually operable windows or panels shall be distributed around the perimeter of each floor at not more than 50-foot (15 240 mm) intervals. The *aggregate* area of operable windows or panels shall not be less than 40 square feet (3.7 m<sup>2</sup>) per 50 linear feet (15 240 mm) of perimeter.

**Exceptions:**

1. In Group *R* occupancies, each sleeping unit or suite having an exterior wall shall be permitted to be provided with 2 square feet (0.19 m<sup>2</sup>) of venting area in lieu of the area specified in Item 1.
2. Windows shall be permitted to be fixed provided that glazing can be cleared *or broken* by fire fighters.
2. Mechanical air-handling equipment providing one exhaust air change every 15 minutes for the area involved. Return and exhaust air shall be moved directly to the outside without recirculation to other portions of the building.
3. Any other approved design that will produce equivalent results.

**403.4.7 Standby power.** A standby power system complying with Chapter 27 shall be provided for standby power loads specified in Section 403.4.7.2.

**403.4.7.1 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 707 or horizontal assemblies constructed in accordance with Section 712, or both. System supervision with manual start and transfer features shall be provided at the fire command center.

**403.4.7.2 Standby power loads.** The following are classified as standby power loads:

1. Power and lighting for the fire command center required by Section 403.4.5;
2. Ventilation and automatic fire detection equipment for smokeproof enclosures; and
3. Standby power shall be provided for elevators in accordance with Sections 1007.4, 3003, 3007 and 3008.

**403.4.8 Emergency power systems.** An emergency power system complying with Chapter 27 shall be provided for emergency power loads specified in Section 403.4.8.1.

**403.4.8.1 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;
5. Fire alarm systems; and
6. Electrically powered fire pumps.

**403.5 Means of egress and evacuation.** The means of egress in high-rise buildings shall comply with Sections 403.5.1 through 403.5.6.

**403.5.1 Remoteness of exit stairway enclosures.** The required exit stairway enclosures shall be separated by a distance not less than 30 feet (9144 mm) or not less than one-fourth of the length of the maximum overall diagonal dimension of the building or area to be served, whichever is less. The distance shall be measured in a straight line between the nearest points of the exit stairway enclosures. In buildings with three or more exit stairway enclosures, at least two of the exit stairway enclosures shall comply with this section. Interlocking or scissor stairs shall be counted as one exit stairway.

**403.5.2 Additional exit stairway.** For buildings other than Group R-2 that are more than 420 feet (128 m) in building height, one additional exit stairway meeting the requirements of Sections 1009 and 1022 shall be provided in addition to the minimum number of exits required by Section 1021.1. The total width of any combination of remaining exit stairways with one exit stairway removed shall not be less than the total width required by Section 1005.1. Scissor stairs shall not be considered the additional exit stairway required by this section.

**Exception:** An additional exit stairway shall not be required to be installed in buildings having elevators used for occupant self-evacuation in accordance with Section 3008.

**403.5.3 Stairway door operation.** Stairway doors other than the exit discharge doors shall be permitted to be locked from the 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.

**403.5.3.1 Stairway communication 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 stairway where the doors to the stairway are locked.

**403.5.4 Smokeproof exit enclosures.** Every required level exit 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 1022.9.

**403.5.5 Deleted.**

**403.5.6 Emergency escape and rescue.** Emergency escape and rescue openings required by Section 1029 are not required.

**403.6 Elevators.** Elevator installation and operation in high-rise buildings shall comply with Chapter 30 and Sections 403.6.1 and 403.6.2.

**403.6.1 Fire service access elevator.** In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, a minimum of one fire service access elevator shall be provided in accordance with Section 3007.

**403.6.2 Occupant evacuation elevators.** Where installed in accordance with Section 3008, passenger elevators for general public use shall be permitted to be used for occupant self-evacuation.

## SECTION 404 ATRIUMS

**404.1 General.** In other than Group H occupancies, and where permitted by Exception 5 in Section 708.2, 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 floor of the atrium shall not be used for other than low fire hazard uses and only approved materials and decorations in accordance with the *fire code*

shall be used in the atrium space.

**Exception:** The atrium floor area is permitted to be used for any approved use where the individual space is provided with an automatic sprinkler system in accordance with Section 903.3.1.1.

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

**Exceptions:**

- 1 That area of a building adjacent to or above the atrium need not be sprinklered provided that portion of the building is separated from the atrium portion by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.
- 2 Where the ceiling of the atrium is more than 55 feet (16 764 mm) above the floor, sprinkler protection at the ceiling of the atrium is not required.

**404.4 Fire alarm system.** A fire alarm system shall be provided in accordance with Section 907.2.14.

**404.5 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.

**404.6 Enclosure of atriums.** Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 712, 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

accounted for in the design of the smoke control system.

**404.7 Standby power.** Equipment required to provide smoke control shall be connected to a standby power system in accordance with Section 909.11.

**404.8 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.

**404.9 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). The travel distance requirements for areas of buildings open to the atrium and where access to the exits is not through the atrium, shall comply with the requirements of Section 1016.

## 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 finished floor of the lowest level of exit discharge.

**Exceptions:**

1. *Deleted.*
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 m<sup>2</sup>) and has an occupant load less than 10.
6. Pumping stations and other similar mechanical spaces intended only for limited periodic use by service or maintenance personnel.

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

**405.3 Automatic sprinkler system.** The highest level of exit discharge serving the underground portions of the building and all levels below shall be equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Water-flow switches and control valves shall be supervised in accordance with Section 903.4.

**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 finished floor of 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 m<sup>2</sup>) 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 710. Penetrations between the two compartments shall be limited to plumbing and electrical piping and conduit that are firestopped in accordance with Section 713. Doorways shall be protected by fire door assemblies that are automatic-closing by smoke detection in accordance with Section 715.4.8.3 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 710. Doors shall be gasketed, have a drop sill and be automatic-closing by smoke detection in accordance with Section 715.4.8.3.

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

**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.

**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 Sections 907.2.18 and 907.2.19.

**405.6 Fire alarm systems.** A fire alarm system shall be provided where required by Sections 907.2.18 and 907.2.19.

**405.7 Means of egress.** Means of egress shall be in accordance with Sections 405.7.1 and 405.7.2.

**405.7.1 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.

**405.7.2 Smokeproof enclosure.** Every required stairway serving floor levels more than 30 feet (9144 mm) below the finished floor of its level of exit discharge shall comply with the requirements for a smokeproof enclosure as provided in Section 1022.9.

**405.8 Standby power.** A standby power system complying with Chapter 27 shall be provided standby power loads specified in Section 405.8.1.

**405.8.1 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.

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

**405.9 Emergency power.** An emergency power system complying with Chapter 27 shall be provided for emergency power loads specified in Section 405.9.1.

**405.9.1 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.

**405.10 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 character of the occupancy shall not exceed 1,000 square feet (93 m<sup>2</sup>) 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 m<sup>2</sup>) 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 m<sup>2</sup>) Group U occupancy shall be permitted to be in the same building, provided each 3,000-square-foot (279 m<sup>2</sup>) area is separated by fire walls complying with Section 706.

**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 ½ -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 (15.9 mm) 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<sup>3</sup>/<sub>8</sub> 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.

**406.1.5 Automatic garage door openers.** Automatic garage door openers, if provided, shall be listed in accordance with UL 325.

#### **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 required by Section 1106.5 shall conform to *“ADAAG” Chapter 11 and ICC A117.1.*

**406.2.3 Guards.** Guards shall be provided in accordance with Section 1013. Guards serving as vehicle barrier systems shall comply with Sections 406.2.4 and 1013.

**406.2.4 Vehicle barrier systems.** Vehicle barrier systems not less than 2 feet 9 inches (835 mm) high shall be placed at the end of drive lanes, and at the end of parking spaces where the vertical distance to the ground or surface directly below is greater than 1 foot (305 mm). Vehicle barrier systems shall comply with the loading requirements of Section 1607.7.3.

**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.

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.

**Exceptions:**

1. Asphalt parking surfaces shall be permitted at ground level.
2. Floors of Group S-2 parking garages shall not be required to have a sloped surface.

**406.2.7 Mixed occupancy separation.** Parking garages shall be separated from other occupancies in accordance with Section 508.1.

**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 Sections 406.3.2 through 406.3.13, 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 barrier systems, 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 402.7.1, 406.3.13, 508.1, 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 508.1.

**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 m<sup>2</sup>). 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.

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 building 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 dimension of 20 feet (6096 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 705.

**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.

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

TYPE OF CONSTRUCTION	AREA PER TIER (square feet)	HEIGHT (in tiers)		
		Ramp access	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 m<sup>2</sup>.

#### **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 *mechanical code*.

#### **406.5 Motor fuel-dispensing facilities.**

**406.5.1 Construction.** Motor fuel-dispensing facilities shall be constructed in accordance with the *fire code* and Sections 406.5.1 through 406.5.3.

**406.5.2 Vehicle fueling pad.** The vehicle shall be fueled on noncoated concrete or other approved paving material having a resistance not exceeding 1 megohm as determined by the methodology in EN 1081.

**406.5.3 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 or UL 723 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 m<sup>2</sup>). The maximum area of any individual panel shall not exceed 100 square feet (9.3 m<sup>2</sup>).

**406.5.3.1 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.

#### **406.6 Repair garages.**

**406.6.1 General.** Repair garages shall be constructed in accordance with the *fire code* and Sections 406.6.1 through 406.6.6. 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 508.1.

**406.6.3 Ventilation.** Repair garages shall be mechanically ventilated in accordance with the *mechanical code*. 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  $0.45 \text{ W/cm}^2$ , as determined by NFPA 253, shall be permitted.

**406.6.5 Heating equipment.** Heating equipment shall be installed in accordance with the *mechanical code*.

**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.

**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.

**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.

**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 Sections 407.1 through 407.9 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 Waiting and similar areas.** 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 accessory occupancies in accordance with 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 accessory occupancies in accordance with Section 508.2.5, 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 ( $140 \text{ m}^2$ ).
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 ( $46.5 \text{ m}^2$ ) 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 508.2.5.

**407.2.5 Cooking facilities.** In Group I-2 nursing homes, rooms or spaces that contain a cooking facility with domestic cooking appliances, such rooms or spaces shall be permitted to be open to the corridor where all of the following requirements are met:

1. The number of care recipients housed within the smoke compartment is not greater than 30.
2. The number of care recipients served by the cooking facility is not greater than 30.
3. Only one cooking facility area is permitted within a smoke compartment.
4. The types of domestic cooking appliances are limited to ovens, cooktops, ranges, warmers and microwaves.
5. The corridor is a clearly identified space delineated by construction or floor pattern, material or color.
6. The space containing the domestic cooking facility shall be arranged so as not to obstruct access to the required exit.
7. A domestic cooking hood installed and constructed in accordance with Section 505 of the mechanical code is provided over the cooktop or range.
8. The domestic cooking hood provided over the cooktop or range shall be equipped with an automatic fire-extinguishing system of a type recognized for protection of domestic cooking equipment. Pre-engineered automatic extinguishing systems shall be tested in accordance with UL 300A and listed and labeled for the intended application. The system shall be installed in accordance with this code, its listing and the manufacturer's instructions.
9. A manual actuation device for the hood suppression system shall be installed in accordance with Sections 904.11.1 and 904.11.2.
10. An interlock device shall be provided such that upon activation of the hood suppression system, the power or fuel supply to the cooktop or range will be turned off.
11. A shut off for the fuel and electrical power supply to the cooking equipment shall be provided in a location that is accessible only to staff.
12. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes.
13. A portable fire extinguisher shall be installed in accordance with Section 906 and within 30 feet (9144 mm) of domestic cooking appliances.

**407.3 Corridor walls.** Corridor walls shall be constructed as smoke partitions in accordance with Section 711.

**407.3.1 Corridor doors.** Corridor doors, other than those in a wall required to be rated by Section 508.2.5 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.

**Exception:** Locking systems installed in accordance with section ~~1008.1.8.6.2~~ 1008.1.9.6 shall be permitted in areas where patients must be restricted for their own safety.

**407.3.3 Projections in corridors.** *In Group I-2 nursing homes, where the corridor width is a minimum of 96 inches (2440 mm), projections shall be permitted for furniture where all of the following conditions are met:*

1. The furniture is attached to the floor or to the wall.
2. The furniture does not reduce the clear width of the corridor to less than 72 inches (1830 mm) except where other encroachments are permitted in accordance with Section 1005.7.
3. The furniture is positioned on only one side of the corridor.
4. Each arrangement of furniture is 50 square feet (4.6 square meters) maximum in area.
5. Furniture arrangements are separated by 10 feet (3050 mm) minimum.
6. Placement of furniture is considered as part of the fire and safety plans in accordance with Section 1001.4.

**407.4 Smoke barriers.** Smoke barriers shall be provided to subdivide every story used by *inpatients* for sleeping or treatment, *regardless of occupant load*, into at least two smoke compartments and to divide other stories *containing a health care occupancy* with an occupant load of 50 or more persons, *regardless of use*, 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 m<sup>2</sup>) 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 710.

**407.4.1 Refuge area.** At least 30 net square feet (2.8 m<sup>2</sup>) 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 m<sup>2</sup>) 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.

**407.4.3 Horizontal assemblies.** Horizontal assemblies supporting smoke barriers required by this section shall be designed to resist the movement of smoke and shall comply with Section 712.9.

**407.5 Automatic sprinkler system.** Smoke compartments containing patient sleeping units shall be equipped throughout with an automatic 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.

**407.6 Fire alarm system.** A fire alarm system shall be provided in accordance with Section 907.2.6.

**407.7 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.

**407.8 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 ( $2.8 \text{ m}^2$ ) for bed and litter patients and 6 net square feet ( $0.56 \text{ m}^2$ ) 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.

**407.9 Hyperbaric facilities.** Hyperbaric facilities in Group I-2 occupancies shall meet the requirements contained in Chapter 20 of NFPA 99.

**SECTION 408  
GROUP I-3**

**408.1 General.** Occupancies in Group I-3 shall comply with the provisions of Sections 408.1 through 408.10 and other applicable provisions of this code (see Section 308.4).

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

**CELL.** A room within a housing unit in a detention or correctional facility used to confine inmates or prisoners.

**CELL TIER.** Levels of cells vertically stacked above one another within a housing unit.

**HOUSING UNIT.** A dormitory or a group of cells with a common dayroom in Group I-3.

**SALLYPORT.** A security vestibule with two or more doors or gates where the intended purpose is to prevent continuous and unobstructed passage by allowing the release of only one door or gate at a time.

**408.2 Other occupancies.** Buildings or portions of buildings in Group I-3 occupancies where security operations necessitate the locking of required means of egress shall be permitted to be classified as a different occupancy. Occupancies classified as other than Group I-3 shall meet the applicable requirements of this code for that occupancy provided provisions are 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 Group H 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 Guard tower doors.** A hatch or trap door not less than 16 square feet

(610 m<sup>2</sup>) in area through the floor and having minimum dimensions of not less than 2 feet (610 mm) in any direction shall be permitted to be used as a portion of the means of egress from guard towers.

**408.3.4 Spiral stairways.** Spiral stairways that conform to the requirements of Section 1009.9 are permitted for access to and between staff locations.

**408.3.5 Ship ladders.** Ship ladders shall be permitted for egress from control rooms or elevated facility observation rooms in accordance with Section 1009.11.

**408.3.6 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 m<sup>2</sup>) per person.

**408.3.7 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.

**408.3.8 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 <sup>3</sup>/<sub>4</sub>-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<sup>2</sup>) and individual panels of glazing shall not exceed 1,296 square inches (0.84 m<sup>2</sup>).
4. The glazing shall be protected on both sides by an automatic 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 a refuge area 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 Protection of vertical openings.** Any vertical opening shall be protected by a shaft enclosure in accordance with Section 708, or shall be in accordance with Section 408.5.1.

**408.5.1 Floor openings.** Openings in floors within a housing unit are permitted without a shaft enclosure, provided all 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 for all occupants from all interconnected cell tiers and areas;
3. The height difference between the floor levels of the highest and lowest cell tiers shall not exceed 23 feet (7010 mm); and

4. Egress from any portion of the cell tier to an exit or exit access door shall not require travel on more than one additional floor level within the housing unit.

**408.5.2 Shaft openings in communicating floor levels.** Where a floor opening is permitted between communicating floor levels of a housing unit in accordance with Section 408.5.1, plumbing chases serving vertically stacked individual cells contained with the housing unit shall be permitted without a shaft enclosure.

**408.6 Smoke barrier.** Occupancies in Group I-3 shall have smoke barriers complying with Sections 408.8 and 710 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 ( $0.56 \text{ m}^2$ ) 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 ( $0.56 \text{ m}^2$ ) 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 wherever 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 Security glazing.** In occupancies in Group I-3, windows and doors in 1-hour fire barriers constructed in accordance with Section 707, fire partitions constructed in accordance with Section 709 and smoke barriers constructed in accordance with Section 710 shall be permitted to have security glazing installed provided that the following conditions are met.

1. Individual panels of glazing shall not exceed 1,296 square inches (0.84

- m<sup>2</sup>).
2. The glazing shall be protected on both sides by an automatic sprinkler system. The sprinkler system shall be designed to, when actuated, wet completely the entire surface of any glazing affected by fire.
  3. 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.
  4. Obstructions, such as curtain rods, drapery traverse rods, curtains, drapes or similar materials shall not be installed between the automatic sprinklers and the glazing.

**408.8 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 408.8.1 through 408.8.4.

**408.8.1 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).

**408.8.2 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.

**408.8.3 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 mm<sup>2</sup>). 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.

**408.8.4 Smoke-tight doors.** Doors in openings in partitions required to be smoke tight by Section 408.8 shall be substantial doors, of construction that will resist the passage of smoke. Latches and door closures are not required on cell doors.

**408.9 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 a tenable environment for exiting from the smoke compartment in the area of fire origin in accordance with Section 909 for each windowless smoke compartment.

**408.10 Fire alarm system.** A fire alarm system shall be provided in accordance with Section 907.2.6.3.

## **SECTION 409 MOTION PICTURE PROJECTION ROOMS**

**409.1 General.** The provisions of Sections 409.1 through 409.5 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 m<sup>2</sup>) for a single machine and at least 40 square feet (3.7 m<sup>2</sup>) 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 *mechanical code*.

**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 Sections 410.1 through 410.7 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 Types 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 complying with NFPA 80 or an approved water curtain complying with Section 903.3.1.1 or, in facilities not utilizing the provisions of smoke-protected assembly seating in accordance with Section 1028.6.2, 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.

**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 *fire code*. Foam plastics and materials containing foam plastics shall comply with Section 2603 and the *fire code*.

**410.3.7 Stage ventilation.** Emergency ventilation shall be provided for stages larger than 1,000 square feet (93 m<sup>2</sup>) 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.

**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 Types 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 m<sup>2</sup>) in area. Where the space beneath the permanent platform is used for storage or any purpose other than equipment, wiring or plumbing, the floor assembly 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.** 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 fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. The minimum fire-resistance rating shall be 2 hours for stage heights greater than 50 feet (15 240 mm) and 1 hour for stage heights of 50 feet (15 240 mm) or less.

**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 not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

**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 device or spiral stairway is permitted to be provided from the gridiron to a scuttle in the stage roof.

**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  $\frac{5}{8}$ -inch (15.9 mm) Type X gypsum board.
2. Sprinklers are not required for stages 1,000 square feet (93 m<sup>2</sup>) 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.

**410.7 Standpipes.** Standpipe systems shall be provided in accordance with Section 905.

## SECTION 411 SPECIAL AMUSEMENT BUILDINGS

**411.1 General.** Special amusement buildings having an occupant load of 50 or more shall comply with the requirements for the appropriate Group A occupancy and Sections 411.1 through 411.8. Amusement buildings having an occupant load of less than 50 shall comply with the requirements for a Group B occupancy and Sections 411.1 through 411.8.

**Exception:** Amusement buildings or portions thereof that are without walls or a roof and constructed to prevent the accumulation of smoke.

For flammable decorative materials, see the fire code.

**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.** 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, *movable, or portable*, the sprinkler water supply shall be of an approved temporary means.

**Exceptions:**

1. Automatic sprinklers are not required where the total floor area of a temporary special amusement *occupancy* is less than 1,000 square feet (93 m<sup>2</sup>) and the travel distance from any point to an exit is less than 50 feet (15 240 mm).
2. *Automatic fire sprinklers are not required where the total floor area of a temporary special amusement occupancy in an existing building is less than 5000 square feet (93 m<sup>2</sup>), the travel distance from any point to an exit is less than 50 feet (15 240 mm), and where, in the opinion of the building official, additional means have been provided to ensure an equivalent level of safety for all occupants during the hours that the special amusement building is operated and occupied. Such additional means may include, but not be limited to: fire watches; reduced occupant loads; additional means of egress; additional detection; and portable fire extinguishers.*

**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 907.2.12.2.

**411.6 Emergency voice/alarm communications system.** An emergency voice/alarm communications system shall be provided in accordance with Sections 907.2.12 and 907.5.2.2, 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 in accordance with this section and Section 1011. 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 and listed low-level exit signs that comply with Section 1011.4, and directional path markings listed in accordance with UL 1994, 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 907.2.12.2.

**411.7.1 Photo luminescent exit signs.** Where photo luminescent exit signs are installed, activating light source and viewing distance shall be in accordance with the listing and markings of the signs.

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

## **SECTION 412 AIRCRAFT-RELATED OCCUPANCIES**

**412.1 General.** Aircraft-related occupancies shall comply with Sections 412.1 through 412.7 and the *fire code*.

**412.2 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.

**FIXED BASE OPERATOR (FBO).** A commercial business granted the right by the airport sponsor to operate on an airport and provide aeronautical services, such as fueling, hangaring, tie-down and parking, aircraft rental, aircraft maintenance and flight instruction.

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

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

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

**TRANSIENT AIRCRAFT.** Aircraft based at another location and at the transient location for not more than 90 days.

### **412.3 Airport traffic control towers.**

**412.3.1 General.** The provisions of Sections 412.3.1 through 412.3.6 shall apply to airport traffic control towers not exceeding 1,500 square feet (140 m<sup>2</sup>) 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.

**412.3.2 Type of construction.** Airport traffic control towers shall be constructed to comply with the height and area limitations of Table 412.3.2.

**TABLE 412.3.2  
HEIGHT AND AREA LIMITATIONS FOR AIRPORT  
TRAFFIC CONTROL TOWERS**

TYPE OF CONSTRUCTION	HEIGHT <sup>a</sup> (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 m<sup>2</sup>.

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

**412.3.3 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 1022.9 are not required where required stairways are pressurized.

**412.3.4 Automatic fire detection systems.** Airport traffic control towers shall be provided with an automatic fire detection system installed in accordance with Section 907.2.

**412.3.5 Standby power.** A standby power system that conforms to Chapter 27 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.

**412.3.6 Accessibility.** Airport traffic control towers *shall* be accessible in accordance with the requirements of “~~ADAAG~~” Chapter 11 and ICC A117.1.

**412.4 Aircraft hangars.** Aircraft hangars shall be in accordance with Sections 412.4.1 through 412.4.6.

**412.4.1 Exterior walls.** Exterior walls located less than 30 feet (9144 mm) from lot lines or a public way shall have a fire-resistance rating not less than 2 hours.

**412.4.2 Basements.** Where hangars have basements, floors over basements 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 basements and the hangar. Access to basements shall be from outside only.

**412.4.3 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 m<sup>2</sup>) 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.

**412.4.4 Heating equipment.** Heating equipment shall be placed in another room separated by 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. 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



20,000	Group III	Group III	Group II						
15,000	Group III	Group III	Group III	Group II	Group III	Group II	Group III	Group II	Group II
12,000	Group III	Group II	Group II						
8,000	Group III	Group II							
5,000	Group III								

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

- a. Aircraft hangars with a door height greater than 28 feet shall be provided with fire suppression for a Group I hangar regardless of maximum fire area.
- b. Groups shall be as classified in accordance with NFPA 409.
- c. Membrane structures complying with Section 3102 shall be classified as a Group IV hangar.

**412.4.6.2 Separation of maximum single fire areas.** Maximum single fire areas established in accordance with hangar classification and construction type in Table 412.4.6 shall be separated by 2-hour fire walls constructed in accordance with Section 706.

**412.5 Residential aircraft hangars.** Residential aircraft hangars as defined in Section 412.2 shall comply with Sections 412.5.1 through 412.5.2.

**412.5.1 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 hangar directly into a room used for sleeping purposes shall not be permitted.

**412.5.2 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.

**412.5.3 Smoke alarms.** Smoke alarms shall be provided within the hangar in accordance with Section 907.2.21.

**412.5.4 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 connected outside the structures.

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

**412.5.5 Height and area limits.** Residential aircraft hangars shall not exceed 2,000 square feet (186 m<sup>2</sup>) in area and 20 feet (6096 mm) in building height.

**412.6 Aircraft paint hangars.** Aircraft painting operations where flammable liquids are used in excess of the maximum allowable quantities per control area listed in Table 307.1(1) shall be conducted in an aircraft paint hangar that complies with the provisions of Sections 412.6.1 through 412.6.6.

**412.6.1 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 *fire code* for such occupancy.

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

**412.6.3 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.

**412.6.4 Storage.** Storage of flammable liquids shall be in a liquid storage room.

**412.6.5 Fire suppression.** Aircraft paint hangars shall be provided with fire suppression as required by NFPA 409.

**412.6.6 Ventilation.** Aircraft paint hangars shall be provided with ventilation as required in the *mechanical code*.

**412.7 Heliports and helistops.** Heliports and helistops shall be permitted to be erected on buildings or other locations where they are constructed in accordance with Sections 412.7.1 through 412.7.4.

**412.7.1 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).

**412.7.2 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 1605.4.

**412.7.3 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 m<sup>2</sup>) in area, the second means of egress is permitted to be a fire escape, alternating tread device or ladder leading to the floor below.

**412.7.4 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 *NFPA 13 and Chapter 23 of the fire 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 1<sup>3</sup>/<sub>4</sub> 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

**414.1 General.** The provisions of Sections 414.1 through 414.7 shall apply to buildings and structures occupied for the manufacturing, processing, dispensing, use or storage of hazardous materials.

**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 *fire code*.

**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 *mechanical code* and the *fire code*.

**414.1.2.1 Aerosols.** Level 2 and 3 aerosol products shall be stored and displayed in accordance with the *fire code*. See Section 311.2 and the *fire code* for occupancy group requirements.

**414.1.3 Information required.** A report shall be submitted to the building official identifying the maximum expected quantities of hazardous materials

to be stored, used in a closed system and used in an open system, and subdivided to separately address hazardous material classification categories based on Tables 307.1(1) and 307.1(2). The methods of protection from such hazards, including but not limited to control areas, fire protection systems and Group H occupancies shall be indicated in the report and on the construction documents. The opinion and report shall be prepared by a qualified person, firm or corporation approved by the building official and provided without charge to the enforcing agency.

For buildings and structures with an occupancy in Group H, separate floor plans shall be submitted identifying the locations of anticipated contents and processes so as to reflect the nature of each occupied portion of every building and structure.

**414.2 Control areas.** Control areas shall comply with Sections 414.2.1 through 414.2.5 and the *fire code*.

**414.2.1 Construction requirements.** Control areas shall be separated from each other by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

**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.

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

**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 assembly 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 assembly 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 Types 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 above grade plane.

**TABLE 414.2.2  
DESIGN AND NUMBER OF CONTROL AREAS**

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA <sup>a</sup>	NUMBER OF CONTROL AREAS PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS <sup>b</sup>
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
	1	100	4	1
Below grade plane	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.

**414.2.5 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 *fire 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 *fire 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 *fire code*.

**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 *fire code* and the *mechanical code*.

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 *fire code* and the *mechanical code*.

The location of supply and exhaust openings shall be in accordance with the *mechanical code*. Exhaust air contaminated by *highly toxic* material shall be treated in accordance with the *fire 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.

**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.

**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 414.5.1 through 414.5.5 of this code and the *fire code*.

**414.5.1 Explosion control.** Explosion control shall be provided in accordance with the *fire 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 *fire code*.

**414.5.2 Monitor control equipment.** Monitor control equipment shall be provided where required by the *fire code*.

**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.

**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<sup>d, e, f</sup>**

CONDITION		MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
Material <sup>a</sup>	Class	Solids pounds	Liquids gallons
<b>A. Health-hazard materials—nonflammable and noncombustible solids and liquids</b>			
1. Corrosives <sup>b, c</sup>	Not Applicable	9,750	975
2. Highly toxics	Not Applicable	20 <sup>b, c</sup>	2 <sup>b, c</sup>
3. Toxics <sup>b, c</sup>	Not Applicable	1,000	100
<b>B. Physical-hazard materials—nonflammable and noncombustible solids and liquids</b>			
1. Oxidizers <sup>b, c</sup>	4	Not Allowed	Not Allowed
	3	1,150 <sup>g</sup>	115
	2	2,250 <sup>h</sup>	225
	1	18,000 <sup>i, j</sup>	1,800 <sup>i, j</sup>
2. Unstable (reactives) <sup>b, c</sup>	4	Not Allowed	Not Allowed
	3	550	55
	2	1,150	115
	1	Not Limited	Not Limited
3. Water (reactives)	3 <sup>b, c</sup>	550	55
	2 <sup>b, c</sup>	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 *fire 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 accumulatively.
- c. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, in accordance with the *fire code*. When Note b also applies, the increase for both notes shall be applied accumulatively.
- 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 414.2.5(2)**

**MAXIMUM ALLOWABLE QUANTITY OF FLAMMABLE AND  
COMBUSTIBLE LIQUIDS IN WHOLESALE AND RETAIL SALES  
OCCUPANCIES PER CONTROL AREA<sup>a</sup>**

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 fire code	Nonsprinklered
Class IA	60	60	30
Class IB, IC, II and IIIA	7,500 <sup>c</sup>	15,000 <sup>c</sup>	1,600
Class IIIB	Unlimited	Unlimited	13,200

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m<sup>2</sup>, 1 gallon = 3.785 L, 1 gallon per minute per square foot = 40.75 L/min/m<sup>2</sup>.

- 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.

**TABLE 414.5.1  
EXPLOSION CONTROL REQUIREMENTS<sup>a</sup>**

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems <sup>b</sup>
<b>HAZARD CATEGORY</b>			
Combustible dusts <sup>c</sup>	—	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 Liquefied	Not Required Not Required	Required Required
Flammable liquid	IA <sup>d</sup> IB <sup>e</sup>	Not Required Not Required	Required Required
Organic peroxides	U I	Required Required	Not Permitted 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 2 <sup>g</sup>	Not Required Not Required	Required Required
<b>SPECIAL USES</b>			
Acetylene generator rooms	—	Not Required	Required
Grain processing	—	Not Required	Required
Liquefied petroleum gas-distribution facilities	—	Not Required	Required
Where explosion hazards exist <sup>f</sup>	Detonation	Required	Not Permitted
	Deflagration	Not Required	Required

a. See Section 414.1.3.

b. See the *fire 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.

**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 Chapter 27.

**Exceptions:**

1. Mechanical ventilation for storage of Class IB and Class IC flammable and combustible liquids in closed containers not exceeding 6.5 gallons (25 L) capacity.
2. Storage areas for Class 1 and 2 oxidizers.
3. Storage areas for Class II, III, IV and V organic peroxides.
4. Storage, use and handling areas for asphyxiant, irritant and radioactive gases.
5. For storage, use and handling areas for highly toxic or toxic materials, see Sections 3704.2.2.8 and 3704.3.4.2 of the *fire code*.
6. Standby power for mechanical ventilation, treatment systems and temperature control systems shall not be required where an approved fail-safe engineered system is installed.

#### **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 *fire code*. The methods of spill control shall be in accordance with the *fire code*.

**414.6 Outdoor storage, dispensing and use.** The outdoor storage, dispensing and use of hazardous materials shall be in accordance with the *fire code*.

**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.

**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.

**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.

**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 m<sup>2</sup>).

**Exception:** The increases permitted by Section 506 apply.

**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.

**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.

**414.7.2 Dispensing, use and handling.** Where hazardous materials having a hazard ranking of 3 or 4 in accordance 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.

**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**

**415.1 Scope.** The provisions of Sections 415.1 through 415.8 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 *fire code*.

**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.

**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.

**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.

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

**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.

**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.

**FLAMMABLE VAPORS OR FUMES.** *Mixtures of gases in air at concentrations equal to or greater than the lower flammability limit (LFL) and less than or equal to the upper flammability limit (UFL).*

**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.

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

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

**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.

**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.

**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 ( $\text{mg}/\text{m}^3$ ). 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 building official shall make such determination.

**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.

**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.

**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.

**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.”

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

**PHYSIOLOGICAL WARNING THRESHOLD LEVEL.** A concentration of air-borne contaminants, normally expressed in parts per million (ppm) or milligrams per cubic meter ( $\text{mg}/\text{m}^3$ ), 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 *fire code*.

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

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

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

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

**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.

**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 m<sup>2</sup>) need not be located on the outer perimeter of the building where they are in accordance with the *fire code* and NFPA 30.
2. Liquid storage rooms having a floor area of not more than 1,000 square feet (93 m<sup>2</sup>) need not be located on the outer perimeter where they are in accordance with the *fire code* and NFPA 30.
3. Spray paint booths that comply with the *fire code* need not be located on the outer perimeter.

**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 *fire code*.

*Exception: All buildings used in the manufacturing, storage, or sale of fireworks shall be located in accordance with the fire code.*

1. Group H-1. Not less than 75 feet (22 860 mm) and not less than required by the *fire code*.

**Exceptions:**

1. *Deleted.*
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 m<sup>2</sup>) 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 *fire code*. Where separations are not specified, the distances required shall not be less than the distances required by Table 415.3.1.

**415.3.2 Detached buildings for Group H-1, H-2 or H-3 occupancy.** The storage of hazardous materials in excess of those amounts listed in Table 415.3.2 shall be in accordance with the applicable provisions of Sections 415.4 and 415.5. 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.

**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 basements, 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 that 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.

**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.

**415.5 Special provisions for Groups H-2 and H-3 occupancies.** Groups 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.

Groups 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.

**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.

**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.

**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 *fire code*.

**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 85, NFPA 120, NFPA 484, NFPA 654, NFPA 655 and NFPA 664, and the *fire code*.

**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).

**TABLE 415.3.1**  
**MINIMUM SEPARATION DISTANCES FOR BUILDINGS**  
**CONTAINING EXPLOSIVE MATERIALS**

QUANTITY OF EXPLOSIVE MATERIAL <sup>a</sup>		MINIMUM DISTANCE (feet)		
		Lot lines <sup>b</sup> and inhabited buildings <sup>c</sup>		Separation of magazines <sup>d, e, f</sup>
Pounds over	Pounds not over	Barricaded <sup>d</sup>	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	1,275	2,000	248
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 = 0.0929m<sup>2</sup>.

- 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 in area need not comply with the requirements of this code, however, all magazines shall comply with the *fire 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.

**TABLE 415.3.2**

### DETACHED BUILDING REQUIRED

A DETACHED BUILDING IS REQUIRED WHEN THE QUANTITY OF MATERIAL EXCEEDS THAT LISTED HEREIN			
Material	Class	Solids and Liquids (tons) <sup>a, b</sup>	Gases (cubic feet) <sup>a, b</sup>
Explosives	Division 1.1 Division 1.2 Division 1.3 Division 1.4 Division 1.4 <sup>c</sup> Division 1.5 Division 1.6	Maximum Allowable Quantity Maximum Allowable Quantity Maximum Allowable Quantity Maximum Allowable Quantity 1 Maximum Allowable Quantity Maximum Allowable Quantity	Not Applicable
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 Class 2	1,200 2,000	Not Applicable Not Applicable
Organic peroxides	Detonable Class I Class II Class III	Maximum Allowable Quantity Maximum Allowable Quantity 25 50	Not Applicable Not Applicable Not Applicable Not Applicable
Unstable (reactives) nondetonable	Class 3 Class 2	1 25	2,000 10,000
Water reactives	Class 3 Class 2	1 25	Not Applicable Not Applicable
Pyrophoric gases	Not Applicable	Not Applicable	2,000

For SI: 1 ton = 906 kg, 1 cubic foot = 0.02832 m<sup>3</sup>, 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 Chapter 33 the *fire 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 307.1(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.

**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 constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. The minimum fire-resistance rating shall be 2 hours where the area is not more than 3,000 square feet (279 m<sup>2</sup>), and 4 hours where the area is greater than 3,000 square feet (279 m<sup>2</sup>).

**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.

**415.6.1.4 Explosion control.** Explosion control shall be provided as specified in the *fire code*, or spaces shall be equipped with the equivalent mechanical ventilation complying with the *mechanical code*.

**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.

**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 building height shall be Type IV.

**415.6.2 Flammable and combustible liquids.** The storage, handling, processing and transporting of flammable and combustible liquids in Groups H-2 and H-3 occupancies shall be in accordance with Sections 415.6.2.1 through 415.6.2.10, the *mechanical code* and the *fire code*.

*Exception:* The design, installation, registration, and inspection of regulated underground storage tanks shall be in accordance with the *fire code* and rules adopted by the state fire marshal and enforced by the fire official, in accordance with sections 3737.87 to 3737.89 of the Revised Code.

**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 occupancies in accordance with the requirements of Section 508.4.

**415.6.2.1.1 Height exception.** Where storage tanks are located within a building no more than one story above grade plane, the height limitation of Section 503 shall not apply for Group H.

**415.6.2.2 Tank protection.** Storage tanks shall be noncombustible and protected from physical damage. Fire barriers or horizontal assemblies or both around the storage tank(s) shall be permitted as the method of protection from physical damage.

**415.6.2.3 Tanks.** Storage tanks shall be approved tanks conforming to

the requirements of the *fire code*.

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

**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 *fire 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.

**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.

**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 *fire code*.

**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 *mechanical code* and the *fire code*.

**415.6.2.9 Explosion venting.** Where Class I liquids are being stored, explosion venting shall be provided in accordance with the *fire code*.

**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.

**415.6.3 Liquefied petroleum gas facilities.** The construction and installation of liquefied petroleum gas facilities shall be in accordance with the requirements of this code, the *fire code*, the *mechanical code*, the *International Fuel Gas Code* and NFPA 58.

**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 *mechanical code*, the *plumbing code* and NFPA 32. Dry cleaning solvents and systems shall be classified in accordance with the *fire code*.

**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 *fire code*.

**415.7.1 Flammable and combustible liquids.** The storage, handling, processing and transporting of flammable and combustible liquids in Group H-3 occupancies shall be in accordance with Section 415.6.2.

**415.7.2 Gas rooms.** When gas rooms are provided, such rooms shall be separated from other areas by not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

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

**415.7.4 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 not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

**415.7.5 Consumer fireworks facilities.** *In addition to other applicable provisions of this code and the fire code, this section shall apply to all structures where consumer fireworks, 1.4G are located for display, sales, or storage.*

**415.7.5.1 Area limitation.** *H-3 fire areas used for the display and sale of consumer fireworks, 1.4G shall not exceed five thousand square feet.*

**415.7.5.2 Fire separation.** *Areas used for the display and sale of consumer fireworks, 1.4G shall be separated from areas used for the storage of consumer fireworks, 1.4G with fire walls that comply with section 706.*

**415.7.5.3 Smoke control.** *A smoke control system shall be provided throughout all display and sales areas in accordance with section 909.*

**415.7.5.4 Awnings, tents, and canopies.** *Awnings, tents, and canopies shall not be used for the display, sale or storage of consumer fireworks, 1.4G.*

**415.7.5.5 Exits.** *Horizontal exits shall not be used as a required exit leading from display and sale areas.*

#### **415.8 Group H-5.**

**415.8.1 General.** In addition to the requirements set forth elsewhere in this code, Group H-5 shall comply with the provisions of Sections 415.8.1 through 415.8.11 and the *fire code*.

#### **415.8.2 Fabrication areas.**

### 415.8.2.1 Hazardous materials in fabrication areas.

**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).

### 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).

**TABLE 415.8.2.1.1**  
**QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE**  
**FABRICATION AREA IN GROUP H-5<sup>a</sup>**

HAZARD CATEGORY	SOLIDS (pounds per square feet)	LIQUIDS (gallons per square feet)	GAS (feet <sup>3</sup> @ NTP/square feet)
<b>PHYSICAL-HAZARD MATERIALS</b>			
Combustible dust	Note b	Not Applicable	Not Applicable
Combustible fiber Loose Baled	Note b Notes b, c	Not Applicable	Not Applicable
Combustible liquid II III A III B Combination Class I, II and III A	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 III A	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 Combination of gaseous and liquefied	Not Applicable	Not Applicable	1.25 1.25 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 0.03 0.03 0.03 0.03	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
<b>HEALTH-HAZARD MATERIALS</b>			
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/m<sup>2</sup>, 1 gallon per square foot = 40.7 L/m<sup>2</sup>, 1 cubic foot @ NTP/square foot = 0.305 m<sup>3</sup> @ NTP/m<sup>2</sup>, 1 cubic foot = 0.02832 m<sup>3</sup>.

- a. Hazardous materials within piping shall not be included in the calculated quantities.
- b. 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).
- c. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
- d. The aggregate quantity of flammable, pyrophoric, toxic and highly toxic gases shall not exceed 9,000 cubic feet at NTP.
- e. The aggregate quantity of pyrophoric gases in the building shall not exceed the amounts set forth in Table 415.3.2.

**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 constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

**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.

**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.

**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.

**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 708. 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.

**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.

**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 *fire code*.

**415.8.2.8 Electrical.**

**415.8.2.8.1 General.** Electrical equipment and devices within the fabrication area shall comply with NFPA 70. 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.

**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.

**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 1018 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.

#### **415.8.4 Service corridors.**

**415.8.4.1 Occupancy.** Service corridors shall be classified as Group H-5.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

#### **415.8.5 Storage of hazardous production materials.**

**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 Section 1804.2 of the *fire 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 *fire code*.

**415.8.5.2 Construction.**

**415.8.5.2.1 HPM rooms and gas rooms.** HPM rooms and gas rooms shall be separated from other areas by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. The minimum fire-resistance rating shall be 2 hours where the area is 300 square feet (27.9 m<sup>2</sup>) or more and 1 hour where the area is less than 300 square feet (27.9 m<sup>2</sup>).

**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 m<sup>2</sup>) shall have at least one exterior door approved for fire department access.
2. Rooms shall be separated from other areas by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. The fire-resistance rating shall be not less than 1 hour for rooms up to 150 square feet (13.9 m<sup>2</sup>) in area and not less than 2 hours where the room is more than 150 square feet (13.9 m<sup>2</sup>) 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.

**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.

**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.

**415.8.5.4 Explosion control.** Explosion control shall be provided where required by Section 414.5.1.

**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.

**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.

**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 ( $0.044 \text{ L/s/m}^2$ ) 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.

**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.

#### **415.8.6 Piping and tubing.**

**415.8.6.1 General.** Hazardous production materials piping and tubing shall comply with this section and *the applicable ASME code, as determined by the registered design professional.*

*In accordance with section 4104.42 of the Revised Code, the owner is responsible for ensuring compliance with the ASME codes. The construction documents shall identify the types and quantities of hazardous materials proposed to be used in the facility to the extent necessary to enable the building official to determine compliance with this code and the fire code. The building official is not authorized to request or review design calculations, material specifications or construction documents for the piping system or to ascertain compliance with the applicable ASME code.*

#### **415.8.6.2 Supply piping and tubing.**

**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.

**415.8.6.2.2 Location in service corridors.** Hazardous production materials supply piping or tubing in service corridors shall be exposed to view.

**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.

**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.

**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.

**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 Sections 415.8.7.1 and 415.8.7.2.

**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.

**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.

**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.

**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.

**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.

**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 all the following gas concentrations:

1. Immediately dangerous to life and health (IDLH) values when the monitoring point is within an exhausted enclosure,

ventilated enclosure or gas cabinet.

2. Permissible exposure limit (PEL) levels when the monitoring point is in an area outside an exhausted enclosure, ventilated enclosure or gas cabinet.
3. For flammable gases, the monitoring detection threshold level shall be vapor concentrations in excess of 25 percent of the lower flammable limit (LFL) when the monitoring is within or outside an exhausted enclosure, ventilated enclosure or gas cabinet.
4. Except as noted in this section, monitoring for highly toxic and toxic gases shall also comply with Chapter 37 of the *fire code*.

**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.

**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.

**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 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 Section 1805.2.3.4 of the *fire code*.
8. Exhaust ventilation flow alarm devices for pyrophoric liquids and Class 3 water-reactive liquids cabinet exhaust ventilation systems required in Section 1805.2.3.4 of the *fire code*.

**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.

**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 Section 1805.2.3.4 of the *fire code*.
10. Flow alarm switches for pyrophoric liquids and Class 3 water-reactive liquids cabinet exhaust ventilation systems required in Section 1805.2.3.4 of the *fire code*.
11. Electrically operated systems required elsewhere in this code or in the *fire code* applicable to the use, storage or handling of HPM.

**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.

**415.8.11 Automatic sprinkler system protection in exhaust ducts for HPM.**

**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 *mechanical code*.

**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.

**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.

**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

**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 *fire code*.

**416.2 Spray rooms.** Spray rooms shall be enclosed with not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. Floors shall be waterproofed and drained in an approved manner.

**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.

**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 *mechanical code*. Where such spaces are not separately enclosed, noncombustible spray curtains shall be provided to restrict the spread of flammable vapors.

**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.

**416.4 Spray booths.** Spray booths shall be designed, constructed and operated in accordance with the *fire code*.

**416.5 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**

**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.

**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.

**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 <sup>1</sup>/<sub>4</sub>-inch (6.35 mm) insulating mill board or other approved equivalent insulation.

**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**

**418.1 Building features.** Manufacturing of organic coatings shall be done only in buildings that do not have pits or basements.

**418.2 Location.** Organic coating manufacturing operations and operations incidental to or connected therewith shall not be located in buildings having other occupancies.

**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.

**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 constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

**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 constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

**418.6 Finished products.** Storage rooms for finished products that are flammable or combustible liquids shall be separated from the processing area by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

## **SECTION 419 LIVE/WORK UNITS**

**419.1 General.** A live/work unit is a dwelling unit or sleeping unit in which a significant portion of the space includes a nonresidential use that is operated by the tenant and shall comply with Sections 419.1 through 419.8.

**Exception:** Dwelling or sleeping units that include an office that is less than 10 percent of the area of the dwelling unit shall not be classified as a live/work unit.

**419.1.1 Limitations.** The following shall apply to all live/work areas:

- 1 The live/work unit is permitted to be a maximum of 3,000 square feet (279 m<sup>2</sup>);
- 2 The nonresidential area is permitted to be a maximum 50 percent of the area of each live/work unit;
- 3 The nonresidential area function shall be limited to the first or main floor only of the live/work unit; and
- 4 A maximum of five nonresidential workers or employees are allowed to occupy the nonresidential area at any one time.

**419.2 Occupancies.** Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Sections 420 and 508 shall not apply within the live/work unit when the live/work unit is in compliance with Section 419. High-hazard and storage occupancies shall not be permitted in a live/work unit. The aggregate area of storage in the nonresidential portion of the live/work unit shall be limited to 10 percent of the space dedicated to nonresidential activities.

**419.3 Means of egress.** Except as modified by this section, the provisions for Group R-2 occupancies in Chapter 10 shall apply to the entire live/work unit.

**419.3.1 Egress capacity.** The egress capacity for each element of the live/work unit shall be based on the occupant load for the function served in accordance

with Table 1004.1.1.

**419.3.2 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).

**419.3.3 Spiral stairways.** Spiral stairways that conform to the requirements of Section 1009.9 shall be permitted.

**419.3.4 Locks.** Egress doors shall be permitted to be locked in accordance with Exception 4 of Section 1008.1.9.3.

**419.4 Vertical openings.** Floor openings between floor levels of a live/work unit are permitted without enclosure.

**419.5 Fire protection.** The live/work unit shall be provided with a monitored fire alarm system where required by Section 907.2.9 and an automatic sprinkler system in accordance with Section 903.2.8.

**419.6 Structural.** Floor loading for the areas within a live/work unit shall be designed to conform to Table 1607.1 based on the function within the space.

**419.7 Accessibility.** Accessibility shall be designed in accordance with Chapter 11.

**419.8 Ventilation.** The applicable requirements of the *mechanical code* shall apply to each area within the live/work unit for the function within that space.

## **SECTION 420 GROUPS I-1, R-1, R-2, R-3**

**420.1 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.

**420.2 Separation walls.** Walls separating dwelling units in the same building, walls separating sleeping units in the same building and walls separating dwelling or sleeping units from other occupancies contiguous to them in the same building shall be constructed as fire partitions in accordance with Section 709.

**420.3 Horizontal separation.** Floor assemblies separating dwelling units in the same buildings, floor assemblies separating sleeping units in the same building and floor assemblies separating dwelling or sleeping units from other occupancies contiguous to them in the same building shall be constructed as horizontal assemblies in accordance with Section 712.

## SECTION 421 HYDROGEN CUTOFF ROOMS

**421.1 General.** When required by the *fire code*, hydrogen cutoff rooms shall be designed and constructed in accordance with Sections 421.1 through 421.8.

**421.2 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.

**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.

**HYDROGEN CUTOFF ROOM.** A room or space that is intended exclusively to house a gaseous hydrogen system.

**421.3 Location.** Hydrogen cutoff rooms shall not be located below grade.

**421.4 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 constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both; or as required by Section 508.2, 508.3 or 508.4, as applicable.

**421.4.1 Opening protectives.** Doors within the fire barriers, 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 421.4.1.1.

**421.4.1.1 Ventilation alternative.** When an exhaust system is used in lieu of the interlock system required by Section 421.4.1, 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.

**421.4.2 Windows.** Operable windows in interior walls shall not be permitted. Fixed windows shall be permitted when in accordance with Section 715.

**421.5 Ventilation.** Cutoff rooms shall be provided with mechanical ventilation in accordance with the applicable provisions for repair garages in Chapter 5 of the

*mechanical code.*

**421.6 Gas detection system.** Hydrogen cutoff rooms shall be provided with an approved flammable gas detection system in accordance with Sections 421.6.1 through 421.6.3.

**421.6.1 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.

**421.6.2 Operation.** Activation of the gas detection system shall result in all of the following:

Initiation of distinct audible and visual alarm signals both inside and outside of the cutoff room.

Activation of the mechanical ventilation system.

**421.6.3 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.

**421.7 Explosion control.** Explosion control shall be provided in accordance with Chapter 9 of the *fire code*.

**421.8 Standby power.** Mechanical ventilation and gas detection systems shall be connected to a standby power system in accordance with Chapter 27.

## SECTION 422 AMBULATORY HEALTH CARE FACILITIES

**422.1 General.** Occupancies classified as Group B ambulatory health care facilities shall comply with the provisions of Sections 422.1 through 422.6 and other applicable provisions of this code.

**422.2 Smoke barriers.** Smoke barriers shall be provided to subdivide every ambulatory care facility greater than 10,000 square feet (929 m<sup>2</sup>) into a minimum of two smoke compartments per story. 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 installed in accordance with Section 710.

**422.3 Refuge area.** At least 30 net square feet (2.8 m<sup>2</sup>) per nonambulatory 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.

**422.4 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.

**422.5 Automatic sprinkler systems.** Automatic sprinkler systems shall be

provided for ambulatory care facilities in accordance with Section 903.2.2.

**422.6 Fire alarm systems.** A fire alarm system shall be provided in accordance with Section 907.2.2.1.

## **SECTION 423 STORM SHELTERS**

**423.1 General.** In addition to other applicable requirements in this code, storm shelters shall be constructed in accordance with ICC-500.

**423.1.1 Scope.** This section applies to the construction of storm shelters constructed as separate detached buildings or constructed as safe rooms within buildings for the purpose of providing safe refuge from storms that produce high winds, such as tornados and hurricanes. Such structures shall be designated to be hurricane shelters, tornado shelters, or combined hurricane and tornado shelters.

**423.2 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.

**STORM SHELTER.** A building, structure or portions(s) thereof, constructed in accordance with ICC 500 and designated for use during a severe wind storm event, such as a hurricane or tornado.

**Community storm shelter.** A storm shelter not defined as a “Residential Storm Shelter.”

**Residential storm shelter.** A storm shelter serving occupants of dwelling units and having an occupant load not exceeding 16 persons.

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**4101:1-9-01 Fire protection systems.**

*[Comment: When a reference is made within this rule to a federal statutory provision, an industry consensus standard, or any other technical publication, the specific date and title of the publication as well as the name and address of the promulgating agency are listed in rule 4101:1-35-01 of the Administrative Code. The application of the referenced standards shall be limited and as prescribed in section 102.5 of rule 4101:1-1-01 of the Administrative Code.]*

**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 *fire 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.

**901.2.1 Approval of fire protection systems.** *Prior to the start of fire protection system installation, alteration, repair, or removal, the owner or the owner's agent shall make application and obtain plan approval from the building official for the proposed work in accordance with Section 106 of the building code.*

**901.2.1.1 Input from the fire official.** *In jurisdictions where the local fire official has requested the opportunity to provide input into the fire protection system approval process conducted by the building official, the owner or the owner's agent is required to submit a copy of construction documents related to fire protection to the local fire official for review in accordance with Section 106.1.2 (5).*

**901.2.1.2 Coordination.** *When the building official or the fire official has indicated an intention to have personnel witness acceptance testing conducted in accordance with Section 901.5, it is the responsibility of the owner or the owner's representative to provide advance notice of when the test are scheduled to both the building official and the fire official.*

**901.3 Modifications.** No person shall remove or modify any fire protection system installed or maintained under the provisions of this code or the *fire 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, the *fire code*, and the *applicable standards referenced in this code*. *Required acceptance tests shall be conducted at the expense of the owner or the owner's representative. The building official may require that the acceptance tests be conducted in the presence of a certified building inspector or certified fire protection inspector. Test results shall be documented and certificates shall be submitted to the building official upon completion. Copies of test records and certificates shall also be maintained at the jobsite and made available to the inspector conducting the fire protection systems final inspections.* 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, *inspected*, and approved.

**901.6 Supervisory service.** Where required, fire protection systems shall be monitored by an supervising station in accordance with NFPA 72.

**901.6.1 Automatic sprinkler systems.** Automatic sprinkler systems shall be monitored by an approved supervising station *in accordance with Section 903.4*.

**901.6.2 Fire alarm systems.** Fire alarm systems required by the provisions of Section 907.2 of this code shall be monitored by an approved supervising station in accordance with Section 907.6.5.

**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 constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both, having a fire-resistance rating of not less than that determined in accordance with Section 707.3.9.

*901.8 Welding and brazing. Welding and brazing of all metallic fire protection piping shall be done in accordance with Section 313 of the mechanical code.*

## **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.

**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.

**ALARM SIGNAL.** A signal indicating an emergency requiring immediate action, such as a signal indicative of fire.

**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.

**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.

**AUDIBLE ALARM NOTIFICATION APPLIANCE.** A notification appliance that alerts by the sense of hearing.

**AUTOMATIC.** As applied to fire protection devices, 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.

**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.

**AUTOMATIC SMOKE DETECTION SYSTEM.** A fire alarm system that has initiation devices that utilize smoke detectors for protection of an area such as a room or space with detectors to provide early warning of fire.

**AUTOMATIC SPRINKLER SYSTEM.** An automatic 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.

**AVERAGE AMBIENT SOUND LEVEL.** The root mean square, A-weighted sound pressure level measured over a 24-hour period, or the time any person is present, whichever time period is less.

**CARBON DIOXIDE EXTINGUISHING SYSTEMS.** A system supplying carbon dioxide (CO<sub>2</sub>) from a pressurized vessel through fixed pipes and nozzles. The system includes a manual- or automatic-actuating mechanism.

**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.

**CLEAN AGENT.** Electrically nonconducting, volatile or gaseous fire extinguishant that does not leave a residue upon evaporation.

**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.

**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.

**DETECTOR, HEAT.** A fire detector that senses heat— either abnormally high temperature or rate of rise, or both.

**DRAFT CURTAIN.** *A structure arranged to limit the spread of smoke and heat along the underside of the ceiling or roof.*

**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.

**ELEVATOR GROUP.** A grouping of elevators in a building located adjacent or directly across from one another that responds to a common hall call button(s).

**EMERGENCY ALARM SYSTEM.** A system to provide indication and warning of emergency situations involving hazardous materials.

**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.

**FIRE ALARM BOX, MANUAL.** See “Manual fire alarm box.”

**FIRE ALARM CONTROL UNIT.** A system component that receives inputs from automatic and manual fire alarm devices and may be capable of supplying

power to detection devices and transponder(s) or off-premises transmitter(s). The control unit may be capable of providing a transfer of power to the notification appliances and transfer of condition to relays or devices.

**FIRE ALARM SIGNAL.** A signal initiated by a fire alarm-initiating device such as a manual fire alarm box, automatic fire detector, waterflow switch or other device whose activation is indicative of the presence of a fire or fire signature.

**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.

**FIRE AREA.** The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or horizontal assemblies of a building. Areas of the building not provided with surrounding walls shall be included in the fire area if such areas are included within the horizontal projection of the roof or floor next above.

**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.

**FIRE DETECTOR, AUTOMATIC.** A device designed to detect the presence of a fire signature and to initiate action.

**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.

**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.

**FOAM-EXTINGUISHING SYSTEM.** A special system discharging a foam made from concentrates, either mechanically or chemically, over the area to be protected.

**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.

**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.

**MANUAL FIRE ALARM BOX.** A manually operated device used to initiate an alarm signal.

**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.

**MULTIPLE-STATION SMOKE ALARM.** Two or more single-station alarm devices that are capable of interconnection such that actuation of one causes the appropriate alarm signal to operate in all interconnected alarms.

**NOTIFICATION ZONE.** See “Zone, notification.”

**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.

**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.

**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.

**SMOKE ALARM.** A single-or multiple-station alarm responsive to smoke.

**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.

**STANDPIPE SYSTEM, CLASSES OF.** Standpipe classes are as follows:

**Class I system.** A system providing 2 ½ -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 1 ½ -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 1 ½ -inch (38 mm) hose stations to supply water for use by building occupants and 2 ½ -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.

**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.

**SUPERVISING STATION.** A facility that receives signals and at which personnel are in attendance at all times to respond to these signals.

**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.

**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.

**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.

**TIRES, BULK STORAGE OF.** Storage of tires where the a

**TROUBLE SIGNAL.** A signal initiated by the fire alarm system or device indicative of a fault in a monitored circuit or component.

**VISIBLE ALARM NOTIFICATION APPLIANCE.** A notification appliance that alerts by the sense of sight.

**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.

**WIRELESS PROTECTION SYSTEM.** A system or a part of a system that can

transmit and receive signals without the aid of wire.

**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.

**ZONE, NOTIFICATION.** An area within a building or facility covered by notification appliances which are activated simultaneously.

## **SECTION 903 AUTOMATIC SPRINKLER SYSTEMS**

**903.1 General.** Automatic sprinkler systems shall comply with this section.

**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 *building* official.

**903.2 Where required.** Approved automatic sprinkler systems in new buildings and structures shall be provided in the locations described in Sections 903.2.1 through 903.2.12.

**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 smoke detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour fire barriers constructed in accordance with Section 707 or not less than 2-hour horizontal assemblies constructed in accordance with Section 712, or both.

**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 from the Group A occupancy to, and including, the nearest level of exit discharge serving the Group A occupancy. For Group A-5 occupancies, the automatic sprinkler system shall be provided in the spaces indicated in Section 903.2.1.5.

**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 m<sup>2</sup>);
2. The fire area has an occupant load of 300 or more;
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies; or

4. The fire area contains a multitheater complex.

**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 m<sup>2</sup>);
2. The fire area has an occupant load of 100 or more; or
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

**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 m<sup>2</sup>);

***Exception:***

*1.1 Fire areas used exclusively for religious worship services with fixed seating*

2. The fire area has an occupant load of 300 or more;

***Exceptions:***

*2.1 Fire areas used primarily for worship with fixed seating.*

*2.2 Fire areas without fixed seating not used for exhibition or display;*

or

3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

***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.*

**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 m<sup>2</sup>);
2. The fire area has an occupant load of 300 or more; or
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

***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.*

**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 m<sup>2</sup>).

**903.2.2 Group B ambulatory health care facilities.**

An automatic sprinkler system shall be installed throughout all fire areas containing a Group B ambulatory health care facility occupancy when either of the following conditions exists at any time:

1. Four or more care recipients are incapable of self-preservation.
2. One or more care recipients who are incapable of self-preservation are located at other than the level of exit discharge serving such an occupancy.

**903.2.3 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 (1115 m<sup>2</sup>) in area
2. Throughout every portion of educational buildings below the lowest level of exit discharge serving that portion of the building.

**Exception:** An automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area where every classroom throughout the building has at least one exterior exit door at ground level.

**903.2.4 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. A Group F-1 fire area exceeds 12,000 square feet (1115 m<sup>2</sup>).
2. A Group F-1 fire area is located more than three stories above grade plane.
3. The combined area of all Group F-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m<sup>2</sup>).

**903.2.4.1 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 m<sup>2</sup>) in area which generate finely divided combustible waste or use finely divided combustible materials.

**903.2.5 Group H.** Automatic sprinkler systems shall be provided in high-hazard occupancies as required in Sections 903.2.5.1 through 903.2.5.3.

**903.2.5.1 General.** An automatic sprinkler system shall be installed in Group H occupancies.

**903.2.5.2 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 903.2.5.2. 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.

**TABLE 903.2.5.2**  
**GROUP H-5 SPRINKLER DESIGN CRITERIA**

<b>LOCATION</b>	<b>OCCUPANCY HAZARD CLASSIFICATION</b>
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

**903.2.5.3 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).

**903.2.6 Group I.** An automatic sprinkler system shall be provided throughout buildings with a Group I fire area.

**Exceptions:**

1. 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.
2. *An automatic sprinkler system installed in accordance with Section 903.3.1.2 shall be allowed in Group I-4 facilities.*

**903.2.7 Group M.** An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

1. A Group M fire area exceeds 12,000 square feet (1115 m<sup>2</sup>).
2. A Group M fire area is located more than three stories above grade plane.
3. The combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m<sup>2</sup>).
4. A Group M occupancy *greater than 8000 square feet* is used for the display and sale of upholstered furniture.

**903.2.7.1 High-piled storage.** An automatic sprinkler system shall be provided in accordance with the *fire code* in all buildings of Group M where storage of merchandise is in high-piled or rack storage arrays.

**903.2.8 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.

***Exceptions:***

1. *An automatic sprinkler system installed in accordance with section 903.3.1.2 shall be allowed in buildings, or portions thereof, of Group R, up to and including four stories in height.*
2. *An automatic sprinkler system installed in accordance with Section 903.3.1.3 shall be allowed in buildings of Group R-3 and R-4.*
3. *An automatic sprinkler system is not required in buildings of Group R-2 permitted to have a single exit per Section 1021.2 where:*
  - a. *The building is not used as an "SRO" occupancy as defined in section 310.2, and*
  - b. *The exit is constructed as an exterior stair per Section 1026, and*
  - c. *The dwelling units egress directly into an exit, and*
  - d. *Two hour fire barriers divide the building into fire areas with a maximum of two dwelling units per floor and not more than six dwelling units per fire area, and*
  - e. *All dwelling units in the fire area must have separations as required by Section 709.1 for dwelling units.*

**903.2.9 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:

1. A Group S-1 fire area exceeds 12,000 square feet (1115 m<sup>2</sup>).
2. A Group S-1 fire area is located more than three stories above grade plane.
3. The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m<sup>2</sup>).
4. A Group S-1 fire area used for the storage of commercial trucks or buses where the fire area exceeds 5,000 square feet (464 m<sup>2</sup>).

**903.2.9.1 Repair garages.** An automatic sprinkler system shall be provided throughout all buildings used as repair garages in accordance with Section 406, as shown:

1. Buildings having two or more stories above grade plane, including

basements, with a fire area containing a repair garage exceeding 10,000 square feet (929 m<sup>2</sup>).

2. Buildings no more than one story above grade plane, with a fire area containing a repair garage exceeding 12,000 square feet (1115 m<sup>2</sup>).
3. Buildings with repair garages servicing vehicles parked in basements.
4. A Group S-1 fire area used for the repair of commercial trucks or buses where the fire area exceeds 5,000 square feet (464 m<sup>2</sup>).

**903.2.9.2 Bulk storage of tires.** Buildings and structures where the area for the storage of tires exceeds 20,000 cubic feet (566 m<sup>3</sup>) shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

**903.2.10 Group S-2 enclosed parking garages.** An automatic sprinkler system shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.4 as follows:

1. Where the fire area of the enclosed parking garage exceeds 12,000 square feet (1115 m<sup>2</sup>); or
2. Where the enclosed parking garage is located beneath other groups.

**Exception:** Enclosed parking garages located beneath Group R-3 occupancies.

**903.2.10.1 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 m<sup>2</sup>).

**903.2.11 Specific building areas and hazards.** In all occupancies an automatic sprinkler system shall be installed for building design or hazards in the locations set forth in Sections 903.2.11.1 through 903.2.11.6.

**Exception: Groups R-3 and U.**

**903.2.11.1 Stories without openings.** An automatic sprinkler system shall be installed throughout all stories, including basements, of all buildings where the floor area exceeds 1,500 square feet (139.4 m<sup>2</sup>) 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. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet (15 240 mm).
2. Openings entirely above the adjoining ground level totaling at least 20

square feet (1.86 m<sup>2</sup>) in each 50 linear feet (15 240 mm), or fraction thereof, of exterior wall in the story on at least one side. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet (15 240 mm).

**903.2.11.1.1 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.

**903.2.11.1.2 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.

**903.2.11.1.3 Basements.** Where any portion of a basement is located more than 75 feet (22 860 mm) from openings required by Section 903.2.11.1, the basement shall be equipped throughout with an approved automatic sprinkler system.

**903.2.11.2 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.

**903.2.11.3 Buildings 55 feet or more in height.** An automatic sprinkler system shall be installed throughout buildings with a floor level having an occupant load of 30 or more that is located 55 feet (16 764 mm) or more above the lowest level of fire department vehicle access.

**Exceptions:**

1. Airport control towers.
2. Open parking structures.
3. Occupancies in Group F-2.

**903.2.11.4 Ducts conveying hazardous exhausts.** Where required by the *mechanical code*, 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).

**903.2.11.5 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.

**903.2.11.6 Other required suppression systems.** In addition to the

requirements of Section 903.2, the provisions indicated in Table 903.2.11.6 also require the installation of a fire suppression system for certain buildings and areas.

**903.2.12 During construction.** Automatic sprinkler systems required during construction, alteration and demolition operations shall be provided in accordance with *Section 3312*.

**903.3 Installation requirements.** Automatic sprinkler systems shall be designed and installed in accordance with Sections 903.3.1 through 903.3.6.

**TABLE 903.2.11.6  
ADDITIONAL REQUIRED SUPPRESSION SYSTEMS**

SECTION	SUBJECT
402.9	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
412.4.6, 412.4.6.1, 412.6.5	Aircraft hangars
415.6.2.4	Group H-2
416.4	Flammable finishes
417.4	Drying rooms
507	Unlimited area buildings
508.2.5	Incidental accessory occupancies
1028.6.2.3	Smoke-protected assembly seating
<i>OFC</i>	Sprinkler system requirements as set forth in Section 903.2.11.6 of the <i>fire code</i>

**903.3.1 Standards.** Sprinkler systems shall be designed and installed in accordance with Section 903.3.1.1, unless otherwise permitted by Sections 903.3.1.2 and 903.3.1.3.

**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.

**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 *building* 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. Rooms or areas that are of noncombustible construction with wholly noncombustible contents.
5. Fire service access elevator machine rooms and machinery spaces.

**903.3.1.2 NFPA 13R sprinkler systems.** Automatic sprinkler systems in Groups *I-1, I-4 and R* occupancies, up to and including four stories in height, shall be permitted to be installed throughout in accordance with NFPA 13R.

**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, provided there is a roof or deck above. 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.

**903.3.1.3 NFPA 13D sprinkler systems.** Automatic sprinkler systems installed in *buildings of Groups I-1, R-3, and R-4* shall be permitted to be installed throughout in accordance with NFPA 13D.

**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.

**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.

**903.3.4 Actuation.** Automatic sprinkler systems shall be automatically actuated unless specifically provided for in this code.

**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 *plumbing code*.

**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.

**903.3.5.1.1 Limited area sprinkler systems.** Limited area sprinkler systems serving fewer than 20 sprinklers 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.

**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.

**903.3.5.2 Secondary water supply.** A secondary on-site water supply equal to the hydraulically calculated sprinkler demand, including the hose stream requirement, shall be provided for high-rise buildings assigned to Seismic Design Category C, D, E or F as determined by this code. The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with NFPA 13.

**Exception: Existing buildings.**

**903.3.6 Hose threads.** Fire hose threads and fittings used in connection with automatic sprinkler systems shall be *approved and compatible with the responding fire department hose threads*.

**903.4 Sprinkler system supervision and alarms.** All valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures and waterflow switches on all sprinkler systems shall be electrically supervised by a listed fire alarm control unit.

**Exceptions:**

1. *Deleted.*
2. Limited area systems serving fewer than 20 sprinklers.
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 system, 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.

**903.4.1 Monitoring.** Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an approved supervising station or, when approved by the *building* 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.

**903.4.2 Alarms.** Approved audible devices shall be connected to every automatic sprinkler system. Such sprinkler waterflow alarm devices shall be activated by waterflow 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.

*Exception: Water-flow alarms are not required for limited area sprinkler systems installed in accordance with Section 903.3.5.1.1.*

**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.

**903.5 Testing and maintenance.** Sprinkler systems shall be tested and maintained in accordance with the “~~International Fire Code~~” *fire code*.

## SECTION 904 ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS

**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.

**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 *building* official. Automatic fire-extinguishing systems shall not be considered alternatives for the purposes of exceptions or reductions allowed by other requirements of this code.

**904.2.1 Commercial hood and duct systems.** Each required commercial kitchen exhaust hood and duct system required by Chapter 5 of the *mechanical code* to have a Type I hood shall be protected with an approved automatic fire-extinguishing system installed in accordance with this code.

**904.3 Installation.** Automatic fire-extinguishing systems shall be installed in accordance with this section.

**904.3.1 Electrical wiring.** Electrical wiring shall be in accordance with

NFPA 70.

**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.

**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.

**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 907.6.2.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**904.9 Halon systems.** Halogenated extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 12A and their listing.

**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.

**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 *mechanical code*.

**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.

**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.

**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.

**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.

**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.

**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 new buildings and structures in accordance with this section. 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 *by the building official*. In buildings used for high-piled combustible storage, fire protection shall be in accordance with the *fire code*.

**905.2 Installation standard.** Standpipe systems shall be installed in accordance with this section and NFPA 14.

**905.3 Required installations.** Standpipe systems shall be installed *when* required by Sections 905.3.1 through 905.3.7 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.

**905.3.1 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.

**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.

**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.

**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 the automatic sprinkler system sized to deliver water at 250 gallons per minute (946.4 L/min) at the most hydraulically remote hose connection while concurrently supplying the automatic sprinkler system demand. The standpipe system shall be designed not to exceed a 50 pounds per square inch (psi) (345 kPa) residual pressure loss with a flow of 250 gallons per minute (946.4 L/min) from the fire department connection to the hydraulically most remote hose connection. 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.
4. At other locations as necessary so that the distance to reach all portions of a tenant space does not exceed 200 feet (60 960 mm) from a hose connection.

**905.3.4 Stages.** Stages greater than 1,000 square feet in area ( $93 \text{ m}^2$ ) 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.

**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.

**905.3.5 Underground buildings.** Underground buildings shall be equipped throughout with a Class I automatic wet or manual wet standpipe system.

**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 Section 1107.5 of the *fire code*.

**905.3.7 Marinas and boatyards.** Standpipes in marinas and boatyards shall comply with Chapter 45 of the *fire code*.

#### **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 *building* 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 (30 480 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.

**Exception:** Where floor areas adjacent to an exit passageway are reachable from exit stairway hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the exit passageway to other areas of the 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 a stairway 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 *building* official is authorized to require that additional hose connections be provided in approved locations.

**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.

**905.4.2 Interconnection.** In buildings where more than one standpipe is provided, the standpipes shall be interconnected in accordance with NFPA 14.

**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.

**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

**905.5.2 Protection.** Fire-resistance-rated protection of risers and laterals of Class II standpipe systems is not required.

**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 *building* official.

**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.

**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.

**905.6.2 Interconnection.** In buildings where more than one Class III standpipe is provided, the standpipes shall be interconnected in accordance with NFPA 14.

**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.

**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.

**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.

**905.8 Dry standpipes.** Dry standpipes shall not be installed.

**Exception:** Where subject to freezing and in accordance with NFPA 14.

**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.

**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

**906.1 Where required.** Portable fire extinguishers shall be installed in the following locations.

1. In Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.  
**Exception:** In Group A, B and E occupancies equipped throughout with quick response sprinklers, portable fire extinguishers shall be required only in locations specified in Items 2 through 6.
2. Within 30 feet (9144 mm) of commercial cooking equipment.
3. In areas where flammable or combustible liquids are stored, used or dispensed.
4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 1415.1 of the *fire code*.
5. Where required by the *fire code* sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the *building* official.

**906.2 General requirements.** Portable fire extinguishers shall be selected,

installed and maintained in accordance with this section and NFPA 10.

**Exceptions:**

1. The travel distance to reach an extinguisher shall not apply to the spectator seating portions of Group A-5 occupancies.
2. Thirty-day inspections shall not be required and maintenance shall be allowed to be once every three years for dry-chemical or halogenated agent portable fire extinguishers that are supervised by a listed and

**TABLE 906.1  
ADDITIONAL REQUIRED PORTABLE FIRE EXTINGUISHERS IN  
THE *FIRE CODE***

<i>OFC</i> SECTION	SUBJECT
303.5	Asphalt kettles
307.5	Open burning
308.1.3	Open flames—torches
309.4	Powered industrial trucks
1105.2	Aircraft towing vehicles
1105.3	Aircraft welding apparatus
1105.4	Aircraft fuel-servicing tank vehicles
1105.5	Aircraft hydrant fuel-servicing vehicles
1105.6	Aircraft fuel-dispensing stations
1107.7	Heliports and helistops
1208.4	Dry cleaning plants
1415.1	Buildings under construction or demolition
1417.3	Roofing operations
1504.4.1	Spray-finishing operations
1505.4.2	Dip-tank operations
1506.4.2	Powder-coating areas
1904.2	Lumberyards/woodworking facilities
1908.8	Recycling facilities
1909.5	Exterior lumber storage
2003.5	Organic-coating areas
2106.3	Industrial ovens
2205.5	Motor fuel-dispensing facilities
2210.6.4	Marine motor fuel-dispensing facilities

2211.6	Repair garages
2306.1	Rack storage
2404.12	Tents and membrane structures
2508.2	Tire rebuilding/storage
2604.2.6	Welding and other hot work
2903.6	Combustible fibers
3403.2.1	Flammable and combustible liquids, general
3404.3.3.1	Indoor storage of flammable and combustible liquids
3404.3.7.5.2	Liquid storage rooms for flammable and combustible liquids
3405.4.9	Solvent distillation units
3406.2.7	Farms and construction sites—flammable and combustible liquids storage
3406.4.10.1	Bulk plants and terminals for flammable and combustible liquids
3406.5.4.5	Commercial, industrial, governmental or manufacturing establishments—fuel dispensing
3406.6.4	Tank vehicles for flammable and combustible liquids
3606.5.7	Flammable solids
3808.2	LP-gas
4504.4	Marinas

approved electronic monitoring device, provided that all of the following conditions are met:

- 2.1. Electronic monitoring shall confirm that extinguishers are properly positioned, properly charged and unobstructed.
  - 2.2. Loss of power or circuit continuity to the electronic monitoring device shall initiate a trouble signal.
  - 2.3. The extinguishers shall be installed inside of a building or cabinet in a noncorrosive environment.
  - 2.4. Electronic monitoring devices and supervisory circuits shall be tested every three years when extinguisher maintenance is performed.
  - 2.5. A written log of required hydrostatic test dates for extinguishers shall be maintained by the owner to verify that hydrostatic tests are conducted at the frequency required by NFPA 10.
3. In Group I-3, portable fire extinguishers shall be permitted to be located at staff locations.

**906.3 Size and distribution.** The size and distribution of portable fire extinguishers shall be in accordance with Sections 906.3.1 through 906.3.4.

**906.3.1 Class A fire hazards.** The minimum sizes and distribution of portable fire extinguishers for occupancies that involve primarily Class A fire hazards shall comply with Table 906.3(1).

**TABLE 906.3(1)**  
**FIRE EXTINGUISHERS FOR CLASS A FIRE HAZARDS**

	<b>LIGHT (Low) HAZARD OCCUPANCY</b>	<b>ORDINARY (Moderate) HAZARD OCCUPANCY</b>	<b>EXTRA (High) HAZARD OCCUPANCY</b>
Minimum Rated Single Extinguisher	2-A <sup>c</sup>	2-A	4-A <sup>a</sup>
Maximum Floor Area Per Unit of A	3,000 square feet	1,500 square feet	1,000 square feet
Maximum Floor Area for Extinguisher <sup>b</sup>	11,250 square feet	11,250 square feet	11,250 square feet
Maximum Travel Distance to Extinguisher	75 feet	75 feet	75 feet

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m<sup>2</sup>, 1 gallon = 3.785 L.

- a. Two 2<sup>1</sup>/<sub>2</sub>-gallon water-type extinguishers shall be deemed the equivalent of one 4-A rated extinguisher.
- b. Annex E.3.3 of NFPA 10 provides more details concerning application of the maximum floor area criteria.
- c. Two water-type extinguishers each with a 1-A rating shall be deemed the equivalent of one 2-A rated extinguisher for Light (Low) Hazard Occupancies.

**906.3.2 Class B fire hazards.** Portable fire extinguishers for occupancies involving flammable or combustible liquids with depths less than or equal to 0.25-inch (6.35 mm) shall be selected and placed in accordance with Table 906.3(2).

Portable fire extinguishers for occupancies involving flammable or combustible liquids with a depth of greater than 0.25-inch (6.35 mm) shall be selected and placed in accordance with NFPA 10.

**TABLE 906.3(2)**

**FLAMMABLE OR COMBUSTIBLE LIQUIDS  
WITH DEPTHS LESS THAN OR EQUAL TO 0.25 INCH**

<b>TYPE OF HAZARD</b>	<b>BASIC MINIMUM EXTINGUISHER RATING</b>	<b>MAXIMUM TRAVEL DISTANCE TO EXTINGUISHERS (feet)</b>
Light (Low)	5-B 10-B	30 50
Ordinary (Moderate)	10-B 20-B	30 50
Extra (High)	40-B 80-B	30 50

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

**Note:** For requirements on water-soluble flammable liquids and alternative sizing criteria, see Section 5.5 of NFPA 10.

**906.3.3 Class C fire hazards.** Portable fire extinguishers for Class C fire hazards shall be selected and placed on the basis of the anticipated Class A or B hazard.

**906.3.4 Class D fire hazards.** Portable fire extinguishers for occupancies involving combustible metals shall be selected and placed in accordance with NFPA 10.

**906.4 Cooking grease fires.** Fire extinguishers provided for the protection of cooking grease fires shall be of an approved type compatible with the automatic fire-extinguishing system agent and in accordance with Section 904.11.5 of the *fire code*.

**906.5 Conspicuous location.** Portable fire extinguishers shall be located in conspicuous locations where they will be readily accessible and immediately available for use. These locations shall be along normal paths of travel, unless the *building official* determines that the hazard posed indicates the need for placement away from normal paths of travel.

**906.6 Unobstructed and unobscured.** Portable fire extinguishers shall not be obstructed or obscured from view. In rooms or areas in which visual obstruction cannot be completely avoided, means shall be provided to indicate the locations of extinguishers.

**906.7 Hangers and brackets.** Hand-held portable fire extinguishers, not housed in cabinets, shall be installed on the hangers or brackets supplied. Hangers or brackets shall be securely anchored to the mounting surface in accordance with the manufacturer's installation instructions.

**906.8 Cabinets.** Cabinets used to house portable fire extinguishers shall not be locked.

**Exceptions:**

1. Where portable fire extinguishers subject to malicious use or damage are provided with a means of ready access.
2. In Group I-3 occupancies and in mental health areas in Group I-2 occupancies, access to portable fire extinguishers shall be permitted to be locked or to be located in staff locations provided the staff has keys.

**906.9 Extinguisher installation.** The installation of portable fire extinguishers shall be in accordance with Sections 906.9.1 through 906.9.3.

**906.9.1 Extinguishers weighing 40 pounds or less.** Portable fire extinguishers having a gross weight not exceeding 40 pounds (18 kg) shall be installed so that their tops are not more than 5 feet (1524 mm) above the floor.

**906.9.2 Extinguishers weighing more than 40 pounds.** Hand-held portable fire extinguishers having a gross weight exceeding 40 pounds (18 kg) shall be installed so that their tops are not more than 3.5 feet (1067 mm) above the floor.

**906.9.3 Floor clearance.** The clearance between the floor and the bottom of installed hand-held portable fire extinguishers shall not be less than 4 inches (102 mm).

**906.10 Wheeled units.** Wheeled fire extinguishers shall be conspicuously located in a designated location.

## SECTION 907 FIRE ALARM AND DETECTION SYSTEMS

**907.1 General.** This section covers the application, installation, performance and maintenance of fire alarm systems and their components.

**907.1.1 Construction documents.** Construction documents for fire alarm systems 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.

**907.1.2 Fire alarm shop drawings.** Shop drawings for fire alarm systems shall be submitted for review and approval prior to system installation, and shall include, but not be limited to, all of the following:

1. A floor plan that indicates the use of all rooms.
2. Locations of alarm-initiating devices.
3. Locations of alarm notification appliances, including candela ratings for visible alarm notification appliances.
4. Location of fire alarm control unit, transponders and notification power supplies.
5. Annunciators.

6. Power connection.
7. Battery calculations.
8. Conductor type and sizes.
9. Voltage drop calculations.
10. Manufacturers' data sheets indicating model numbers and listing information for equipment, devices and materials.
11. Details of ceiling height and construction.
12. The interface of fire safety control functions.
13. Classification of the supervising station.

**907.1.3 Equipment.** Systems and components shall be listed and approved for the purpose for which they are installed.

**907.2 Where required—new buildings and structures.** An approved 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 907.5, unless other requirements are provided by another section of this code.

A minimum of one manual fire alarm box shall be provided in an approved location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed.

**Exceptions:**

1. The manual fire alarm box is not required for fire alarm systems dedicated to elevator recall control and supervisory service.
2. The manual fire alarm box is not required for Group R-2 occupancies unless required by the *building* official to provide a means for fire watch personnel to initiate an alarm during a sprinkler system impairment event. Where provided, the manual fire alarm box shall not be located in an area that is accessible to the public.

**907.2.1 Group A.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 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 installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler waterflow.

**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 Section 907.5.2.2.

**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.

**907.2.2 Group B.** A manual fire alarm system shall be installed in Group B occupancies where one of the following conditions exists:

1. The combined Group B occupant load of all floors is 500 or more.
2. The Group B occupant load is more than 100 persons above or below the lowest level of exit discharge.
3. The Group B fire area contains a Group B ambulatory health care facility.

**Exception:** Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler waterflow.

**907.2.2.1 Group B ambulatory health care facilities.** Fire areas containing Group B ambulatory health care facilities shall be provided with an electronically supervised automatic smoke detection system installed within the ambulatory health care facility and in public use areas outside of tenant spaces, including public corridors and elevator lobbies.

**Exception:** Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, provided the occupant notification appliances will activate throughout the notification zones upon sprinkler waterflow.

**907.2.3 Group E.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 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. A manual fire alarm system is not required in 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 of the following apply:

- 2.1 Interior corridors are protected by smoke detectors.
  - 2.2 Auditoriums, cafeterias, gymnasiums and similar areas 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 The capability to activate the evacuation signal from a central point is provided.
  - 2.5 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 *building* 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 installed in accordance with Section 903.3.1.1, the notification appliances will activate on sprinkler waterflow and manual activation is provided from a normally occupied location.

**907.2.4 Group F.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group F occupancies where both of the following conditions exist:

1. The Group F occupancy is two or more stories in height; and
2. The Group F occupancy has a combined occupant load of 500 or more above or below the lowest level of exit discharge.

**Exception:** Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler waterflow.

**907.2.5 Group H.** A manual fire alarm system that activates the occupant notification system shall be installed in Group H-5 occupancies and in occupancies used for the manufacture of organic coatings. An automatic smoke detection system that activates the occupant notification system shall be installed for highly toxic gases, organic peroxides and oxidizers in accordance with Chapters 37, 39 and 40, respectively, of the *fire code* .

**907.2.6 Group I.** A manual fire alarm system that activates the occupant notification system shall be installed in Group I occupancies. An automatic smoke detection system that activates the occupant notification system shall be provided in accordance with Sections 907.2.6.1, 907.2.6.2 and 907.2.6.3.3.

**Exceptions:**

1. 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 907.4.2 are not exceeded.
2. Occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is approved by the *building* official.

**907.2.6.1 Group I-1.** An automatic smoke detection system shall be installed in corridors, waiting areas open to corridors and habitable spaces other than sleeping units and kitchens. The system shall be activated in accordance with Section 907.5.

**Exceptions:**

1. Smoke detection in habitable spaces is not required where the facility is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
  2. Smoke detection is not required for exterior balconies.
- 907.2.6.1.1 Smoke alarms.** Single-and multiple-station smoke alarms shall be installed in accordance with Section 907.2.11.

**907.2.6.2 Group I-2.** An automatic smoke detection system shall be installed in 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. The system shall be activated in accordance with Section 907.5. Hospitals shall be equipped with smoke detection as required in Section 407.

**Exceptions:**

1. Corridor smoke detection is not required in smoke compartments that contain patient sleeping units where such 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 shall provide 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.

**907.2.6.3 Group I-3 occupancies.** Group I-3 occupancies shall be equipped with a manual fire alarm system and automatic smoke detection

system installed for alerting staff.

**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.

**907.2.6.3.2 Manual fire alarm boxes.** Manual fire alarm boxes are not required to be located in accordance with Section 907.4.2 where the fire alarm boxes are provided at staff-attended locations having direct supervision over areas where manual fire alarm boxes have been omitted.

**907.2.6.3.2.1 Manual fire alarm boxes in detainee areas.** Manual fire alarm boxes are allowed 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.

**907.2.6.3.3 Automatic smoke detection system.**

An 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 as described in Section 308.
3. Smoke detectors are not required in sleeping units with four or fewer occupants in smoke compartments that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

**907.2.7 Group M.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group M occupancies where one of the following conditions exists:

1. The combined Group M occupant load of all floors is 500 or more persons.
2. The Group M occupant load is more than 100 persons above or below the lowest level of exit discharge.

**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 installed in accordance with Section 903.3.1.1 and the occupant notification appliances will automatically activate throughout the notification zones upon sprinkler waterflow.

**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 waterflow 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 907.5.2.2.

**907.2.8 Group R-1.** Fire alarm systems and smoke alarms shall be installed in Group R-1 occupancies as required in Sections 907.2.8.1 through 907.2.8.3.

**907.2.8.1 Manual fire alarm system.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 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 contiguous attic and crawl spaces to those units 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 all of 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 waterflow; and
  - 2.3. At least one manual fire alarm box is installed at an approved location.

**907.2.8.2 Automatic smoke detection system.** An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed throughout all interior corridors serving sleeping units.

**Exception:** An automatic smoke 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

exit or to an exterior exit access that leads directly to an exit.

**907.2.8.3 Smoke alarms.** Single-and multiple-station smoke alarms shall be installed in accordance with Section 907.2.11.

**907.2.9 Group R-2.** Fire alarm systems and smoke alarms shall be installed in Group R-2 occupancies as required in Sections 907.2.9.1 and 907.2.9.2.

*Exception: Fire alarm systems and smoke alarms installed within an “SRO” occupancy, as defined in Section 310.2, shall be installed as required in Section 907.2.8 for Group R-1 occupancies.*

**907.2.9.1 Manual fire alarm system.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 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 16 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 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 and the occupant notification appliances will automatically activate throughout the notification zones upon a sprinkler waterflow.
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 1026.6, Exception 4.

**907.2.9.2 Smoke alarms.** Single-and multiple-station smoke alarms shall be installed in accordance with Section 907.2.11.

**907.2.10 Group R-4.** Fire alarm systems and smoke alarms shall be installed in Group R-4 occupancies as required in Sections 907.2.10.1 through

## 907.2.10.3.

**907.2.10.1 Manual fire alarm system.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-4 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 contiguous attic and crawl spaces to those units 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 waterflow; and
  - 2.3. At least one manual fire alarm box is installed at an approved location.
3. Manual fire alarm boxes in resident or patient sleeping areas shall not be required at exits where 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 907.4.2.1 are not exceeded.

**907.2.10.2 Automatic smoke detection system.** An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in corridors, waiting areas open to corridors and habitable spaces other than sleeping units and kitchens.

**Exceptions:**

1. Smoke detection in habitable spaces is not required where the facility is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
2. An automatic smoke 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 exit or to an exterior exit access that leads directly to an exit.

**907.2.10.3 Smoke alarms.** Single-and multiple-station smoke alarms shall be installed in accordance with Section 907.2.11.

**907.2.11 Single-and multiple-station smoke alarms.** Listed single-and multiple-station smoke alarms complying with UL 217 shall be installed in accordance with Sections 907.2.11.1 through 907.2.11.4 and NFPA 72.

**907.2.11.1 Group R-1 and “SRO” occupancies (as defined in section 310.2).** Single-or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1 and “SRO” occupancies:

1. In sleeping areas.
2. In every room in the path of the means of egress from the sleeping area to the door leading from the sleeping unit.
3. In each story within the sleeping unit, including basements. For sleeping 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.

**907.2.11.2 Groups R-2 (except “SRO” occupancies as defined in section 310.2), R-3, R-4 and I-1.** Single-or multiple-station smoke alarms shall be installed and maintained in Groups R-2 (except “SRO” occupancies as defined in section 310.2), 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.

**Exception:** Single-or multiple-station smoke alarms in Group I-1 shall not be required where smoke detectors are provided in the sleeping rooms as part of an automatic smoke detection system.

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.

**907.2.11.3 Interconnection.** Where more than one smoke alarm is required to be installed within an individual dwelling unit or sleeping unit in Group R-1, R-2, R-3 or R-4, 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.

**907.2.11.4 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 with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system. 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 where they are connected to an emergency electrical system.

**907.2.12 Special amusement buildings.** An automatic smoke detection system shall be provided in special amusement buildings in accordance with Sections 907.2.12.1 through 907.2.12.3.

**907.2.12.1 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 907.2.12.2.

**907.2.12.2 System response.** The activation of two or more smoke detectors, a single smoke detector equipped with an alarm verification feature, 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;
3. Activate an approved directional exit marking that will become apparent in an emergency; and
4. Activate a prerecorded message, 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.

**907.2.12.3 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 Section 907.5.2.2 and be audible throughout the entire special amusement building.

**907.2.13 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 smoke detection system in accordance with Section 907.2.13.1, a fire department

communication system in accordance with Section 907.2.13.2 and an emergency voice/alarm communication system in accordance with Section 907.5.2.2.

**Exceptions:**

1. Airport traffic control towers in accordance with Sections 907.2.22 and 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 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.
6. In Group I-1 and I-2 occupancies, the alarm shall sound at a constantly attended location and general occupant notification shall be broadcast by the emergency voice/alarm communication system.

**907.2.13.1 Automatic smoke detection.** Automatic smoke detection in high-rise buildings shall be in accordance with Sections 907.2.13.1.1 and 907.2.13.1.2.

**907.2.13.1.1 Area smoke detection.** Area 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 in accordance with Section 907.5.2.2. 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.
2. In each elevator machine room and in elevator lobbies.

**907.2.13.1.2 Duct smoke detection.** Duct smoke detectors complying with Section 907.3.1 shall be located as follows:

1. 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 m<sup>3</sup>/s). Such detectors shall be located in a serviceable area downstream of the last duct inlet.
2. 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 smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm (2.4 m<sup>3</sup>/s) and serving not more than 10 air-inlet

openings.

**907.2.13.2 Fire department communication system.** Where a wired communication system is approved in lieu of a radio coverage system in accordance with Section 510 of the *fire code*, the wired fire department communication system shall be designed and installed in accordance with NFPA 72 and shall operate between a fire command center complying with Section 911, 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 exit stairway.

**907.2.14 Atriums connecting more than two stories.** A fire alarm system shall be installed in occupancies with an atrium that connects more than two stories, with smoke detection installed throughout the atrium. The system shall be activated in accordance with Section 907.5. Such occupancies in Group A, E or M shall be provided with an emergency voice/alarm communication system complying with the requirements of Section 907.5.2.2.

**907.2.15 High-piled combustible storage areas.** An automatic smoke detection system shall be installed throughout high-piled combustible storage areas where required by Section 2306.5 of the *fire code*.

**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 *fire code*.

**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.

**907.2.18 Underground buildings with smoke control systems.** Where a smoke control system is installed in an underground building in accordance with this code, automatic smoke detectors shall be provided in accordance with Section 907.2.18.1.

**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 m<sup>3</sup>/s) and serving not more than 10 air-inlet openings.

**907.2.18.2 Alarm required.** Activation of the smoke control system shall activate an audible alarm at a constantly attended location.

**907.2.19 Deep underground buildings.** Where the lowest level of a structure is more than 60 feet (18 288 mm) below the finished floor of 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 907.5.2.2.

**907.2.20 Covered mall buildings.** Covered mall buildings exceeding 50,000 square feet (4645 m<sup>2</sup>) 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 907.5.2.2.

**907.2.21 Residential aircraft hangars.** A minimum of one single-station 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 which will be audible in all sleeping areas of the dwelling.

**907.2.22 Airport traffic control towers.** An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be provided in airport control towers in all occupiable and equipment spaces.

**Exception:** Audible appliances shall not be installed within the control tower cab.

**907.2.23 Battery rooms.** An automatic smoke detection system shall be installed in areas containing stationary storage battery systems with a liquid capacity of more than 50 gallons (189 L).

**907.3 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 unit 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 activate a visible and audible supervisory signal at a constantly attended location. In buildings not 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 NFPA 72.

**907.3.1 Duct smoke detectors.** Smoke detectors installed in ducts shall be

listed for the air velocity, temperature and humidity present in the duct. Duct smoke detectors shall be connected to the building's fire alarm control unit when a fire alarm system is required by Section 907.2. Activation of a duct smoke detector shall initiate a visible and audible supervisory signal at a constantly attended location and shall perform the intended fire safety function in accordance with this code and the *mechanical code*. 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 an 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.

**907.3.2 Delayed egress locks.** Where delayed egress locks are installed on means of egress doors in accordance with Section 1008.1.9.6, an automatic smoke or heat detection system shall be installed as required by that section.

**907.3.3 Elevator emergency operation.** Automatic fire detectors installed for elevator emergency operation shall be installed in accordance with the provisions of ASME A17.1 and NFPA 72.

**907.3.4 Wiring.** 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.

**907.4 Initiating devices.** Where manual or automatic alarm initiation is required as part of a fire alarm system, the initiating devices shall be installed in accordance with Sections 907.4.1 through 907.4.3.

**907.4.1 Protection of fire alarm control unit.** In areas that are not continuously occupied, a single smoke detector shall be provided at the location of each fire alarm control unit, notification appliance circuit power extenders, and supervising station transmitting equipment.

**Exceptions:**

- 1 Where ambient conditions prohibit installation of a smoke detector, a heat detector shall be permitted.
- 2 The smoke detector shall not be required where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

**907.4.2 Manual fire alarm boxes.** Where a manual fire alarm system is required by another section of this code, it shall be activated by fire alarm

boxes installed in accordance with Sections 907.4.2.1 through 907.4.2.5.

**907.4.2.1 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).

**907.4.2.2 Height.** The height of the manual fire alarm boxes shall be a minimum of 42 inches (1067 mm) and a maximum of 48 inches (1372 mm) measured vertically, from the floor level to the activating handle or lever of the box.

**907.4.2.3 Color.** Manual fire alarm boxes shall be red in color.

**907.4.2.4 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.

**907.4.2.5 Protective covers.** The *building* 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. Protective covers shall not project more than that permitted by Section 1003.3.3.

**907.4.3 Automatic smoke detection.** Where an automatic smoke detection system is required it shall utilize smoke detectors unless ambient conditions prohibit such an installation. In spaces where smoke detectors cannot be utilized due to ambient conditions, approved automatic heat detectors shall be permitted.

**907.4.3.1 Automatic sprinkler system.** For conditions other than specific fire safety functions noted in Section 907.3, in areas where ambient conditions prohibit the installation of smoke detectors, an automatic sprinkler system installed in such areas in accordance with Section 903.3.1.1 or 903.3.1.2 and that is connected to the fire alarm system shall be approved as automatic heat detection.

**907.5 Occupant notification systems.** A fire alarm system shall annunciate at the panel and shall initiate occupant notification upon activation, in accordance with Sections 907.5.1 through 907.5.2.3.4. Where a fire alarm system is required by another section of this code, it shall be activated by:

1. Automatic fire detectors.
2. Sprinkler waterflow devices.
3. Manual fire alarm boxes.
4. Automatic fire-extinguishing systems.

**Exception:** Where notification systems are allowed elsewhere in Section 907 to annunciate at a constantly attended location.

**907.5.1 Presignal feature.** A presignal feature shall not be installed unless approved by the *building* official and the fire department. Where a presignal feature is provided, a signal shall be annunciated at a constantly attended location approved by the fire department, in order that occupant notification can be activated in the event of fire or other emergency.

**907.5.2 Alarm notification appliances.** Alarm notification appliances shall be provided and shall be listed for their purpose. *Audible and visual alarm notification ~~appliance~~ appliances shall be located and installed in accordance with this section, the “ADAAG” and NFPA 72, ~~as referenced in Chapter 35 Chapter 11, and ICC A117.1.~~*

**907.5.2.1 Audible alarms.** Audible alarm notification appliances shall be provided and emit a distinctive sound that is not to be used for any purpose other than that of a fire alarm.

**Exception:** Visible alarm notification appliances shall be allowed in lieu of audible alarm notification appliances in critical care areas of Group I-2 occupancies.

**907.5.2.1.1 Average sound pressure.** 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 occupiable space within the building. The minimum sound pressure levels shall be: 75 dBA in occupancies in Groups R and I-1; 90 dBA in mechanical equipment rooms and 60 dBA in other occupancies.

**907.5.2.1.2 Maximum sound pressure.** The maximum sound pressure level for audible alarm notification appliances shall be 110 dBA at the minimum hearing distance from the audible appliance. Where the average ambient noise is greater than 95 dBA, visible alarm notification appliances shall be provided in accordance with NFPA 72 and audible alarm notification appliances shall not be required.

**907.5.2.2 Emergency voice/alarm communication systems.** Emergency voice/alarm communication systems required by this code shall be

designed and installed in accordance with NFPA 72. The operation of any automatic fire detector, sprinkler waterflow 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 in accordance with the building's fire safety and evacuation plans required by Section 404 *of the fire code*. In high-rise buildings, the system shall operate on a minimum of the alarming floor, the floor above and the floor below. Speakers shall be provided throughout the building by paging zones. At 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.

**907.5.2.2.1 Manual override.** A manual override for emergency voice communication shall be provided on a selective and all-call basis for all paging zones.

**907.5.2.2.2 Live voice messages.** The emergency voice/alarm communication system shall also have the capability to broadcast live voice messages by paging zones on a selective and all-call basis.

**907.5.2.2.3 Alternate uses.** 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.

**907.5.2.2.4 Emergency power.** Emergency voice/alarm communications systems shall be provided with an approved emergency power source.

**907.5.2.3 Visible alarms.** Visible alarm notification appliances shall be provided in accordance with Sections 907.5.2.3.1 through 907.5.2.3.4.

**Exceptions:**

1. ~~Deleted.~~ Visible alarm notification appliances are not required in alterations, except where, as part of the alteration, an existing notification appliance is relocated, 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.
3. Visible alarm notification appliances shall not be required in elevator cars.

**907.5.2.3.1 Public and common areas.** Visible alarm notification appliances shall be provided in public *use* areas and common *use* areas.

**907.5.2.3.2 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 employee(s).

**907.5.2.3.3 Deleted. Groups I-1 and R-1.** Group I-1 and R-1 dwelling units or sleeping units in accordance with Table 907.5.2.3.3 shall be provided with a visible alarm notification appliance, activated by both the in-room smoke alarm and the building fire alarm system.

**TABLE 907.5.2.3.3**  
**VISIBLE ALARMS**

<b><u>Number of Sleeping Units</u></b>	<b><u>Sleeping Accommodations with Visible Alarms</u></b>
<b><u>2 to 25</u></b>	<b><u>2</u></b>
<b><u>26 to 50</u></b>	<b><u>4</u></b>
<b><u>51 to 75</u></b>	<b><u>7</u></b>
<b><u>76 to 100</u></b>	<b><u>9</u></b>
<b><u>101 to 150</u></b>	<b><u>12</u></b>
<b><u>151 to 200</u></b>	<b><u>14</u></b>
<b><u>201 to 300</u></b>	<b><u>17</u></b>
<b><u>301 to 400</u></b>	<b><u>20</u></b>
<b><u>401 to 500</u></b>	<b><u>22</u></b>
<b><u>501 to 1000</u></b>	<b><u>5% of total</u></b>
<b><u>1001 and over</u></b>	<b><u>50 plus 3 for each 100 over 1000</u></b>

**907.5.2.3.4 Deleted. 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.

**907.6 Installation.** A fire alarm system shall be installed in accordance with this section and NFPA 72.

**907.6.1 Wiring.** Wiring shall comply with the requirements of NFPA 70 and NFPA 72. Wireless protection systems utilizing radio-frequency transmitting devices shall comply with the special requirements for supervision of low-power wireless systems in NFPA 72.

**907.6.2 Power supply.** The primary and secondary power supply for the fire alarm system shall be provided in accordance with NFPA 72.

**Exception:** Back-up power for single-station and multiple-station smoke alarms as required in Section 907.2.11.4.

**907.6.3 Zones.** Each floor shall be zoned separately and a zone shall not exceed 22,500 square feet (2090 m<sup>2</sup>). 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.

**907.6.3.1 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.

**907.6.3.2 High-rise buildings.** In high-rise buildings, a separate zone by floor shall be provided for each of the following types of alarm-initiating devices where provided:

- 1) Smoke detectors.
- 2) Sprinkler waterflow devices.
- 3) Manual fire alarm boxes.
- 4) Other approved types of automatic fire detection devices or suppression systems.

**907.6.4 Access.** Access shall be provided to each fire alarm device and notification appliance for periodic inspection, maintenance and testing.

**907.6.5 Monitoring.** Fire alarm systems required by this chapter shall be monitored by an approved supervising station in accordance with NFPA 72.

**Exception:** Monitoring by a supervising station is not required for:

1. Single-and multiple-station smoke alarms required by Section 907.2.11.
2. Smoke detectors in Group I-3 occupancies.
3. Deleted.

**907.6.5.1 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 *building official with input from the fire chief*.

**907.7 Acceptance tests and completion.** Upon completion of the installation, the fire alarm system and all fire alarm components shall be tested in accordance with NFPA 72.

**907.7.1 Single-and multiple-station alarm devices.**

When the installation of the alarm devices is complete, each device and interconnecting wiring for multiple-station alarm devices shall be tested in accordance with the smoke alarm provisions of NFPA 72.

**907.7.2 Record of completion.** A record of completion in accordance with NFPA 72 verifying that the system has been installed and tested in accordance with the approved plans and specifications shall be provided.

**907.7.3 Instructions.** Operating, testing and maintenance instructions and record drawings (“as-builts”) and equipment specifications shall be provided at an approved location.

**907.8 Inspection, testing and maintenance.** The maintenance and testing schedules and procedures for fire alarm and fire detection systems shall be in accordance with Section 907.9 of the *fire code*.

## **SECTION 908 EMERGENCY ALARM SYSTEMS**

**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.

**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.

**908.3 Highly toxic and toxic materials.** A gas detection system shall be provided to detect the presence of highly toxic or toxic 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.

**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.

**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.

**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.

**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.

**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 *mechanical code*. 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 *mechanical code*.

**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.** In addition to the ordinary inspection and test requirements which buildings, structures and parts thereof are required to undergo, smoke control systems subject to the provisions of Section 909 shall undergo special inspections and tests sufficient to verify the proper commissioning of the smoke control design in its final installed condition. The design submission accompanying the construction documents shall clearly detail procedures and methods to be used and the items subject to such inspections and tests. Such commissioning shall be in accordance with generally accepted engineering practice and, where possible, based on published standards for the particular testing involved. The special inspections and tests required by this

section shall be conducted under the same terms in Section 1704.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**909.5 Smoke barrier construction.** *Where provided, smoke barriers shall comply with Section 710, 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.

**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 *building* official.

**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 907.3.
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 715.4.8.3. 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.

**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.

**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.

**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.

**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 (m<sup>2</sup>).

d = Distance from door handle to latch edge of door, feet (m).

F = Total door opening force, pounds (N).

F<sub>dc</sub> = Force required to overcome closing device, pounds (N).

K = Coefficient 5.2 (1.0).

W = Door width, feet (m).

Δ P = Design pressure difference, inches of water (Pa).

**909.7 Airflow design method.** When approved by the *building* 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.

**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<sub>f</sub> = Temperature of smoke, °F (K).

T<sub>o</sub> = Temperature of ambient air, °F (K).

v = Air velocity, feet per minute (m/minute).

**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.

**909.8 Exhaust method.** When approved by the *building* 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.

**909.8.1 Smoke layer.** The height of the lowest horizontal surface of the smoke layer interface 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.

**909.9 Design fire.** The design fire shall be based on a rational analysis performed by the registered design professional and approved by the *building* official. The design fire shall be based on the analysis in accordance with Section 909.4 and this section.

**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.

**909.9.2 Separation distance.** Determination of the design fire shall include consideration of the type of fuel, fuel spacing and configuration.

**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.

**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.

**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 *building* official.

**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  $T_s$  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 *mechanical code*. 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 *mechanical code*, that are constructed of approved fire-resistance-rated materials.

**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.

**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 *Section 716.3*.

**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 this code. The standby power source and its transfer switches shall be in a room separate from the normal power transformers and switch gears and ventilated directly to and from the exterior. The room shall be enclosed with not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

**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.

**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 NFPA 70, all wiring, regardless of voltage, shall be fully enclosed within continuous raceways.

**909.12.2 Activation.** Smoke control systems shall be activated in accordance with this section.

**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.

**909.12.2.2 Passive method.** Passive smoke control systems actuated by approved spot-type detectors listed for releasing service shall be permitted.

**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.

**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.

**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 B16.22. 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 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 a galvanized or paint-grade steel enclosure having a minimum thickness of 0.0296 inch (0.7534 mm) (No. 22 gage). 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 the enclosure. Tubing bridging cabinets and doors or moveable devices 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.

**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.

**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.

**909.14 Marking and identification.** The detection and control systems shall be clearly marked at all junctions, accesses and terminations.

**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 *building* official, the fire department and in the fire command center in a format and manner approved by the *building official with input from 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 all 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.

**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.

**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 firefighter's control panel actions shall be as follows:

1. ON-OFF and 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 NFPA 70.

2. Only the AUTO position of each three-position fire-fighter's control panel switch shall allow automatic 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.

**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.

**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.

**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.

**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.

**909.18.3 Dampers.** Dampers shall be tested for function in their installed condition.

**909.18.4 Inlets and outlets.** Inlets and outlets shall be read using generally accepted practices to determine air quantities.

**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.

**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.

**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.

**909.18.8 Special inspections for smoke control.** Smoke control systems shall be tested by a special inspector.

**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.

**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.

**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.

**909.18.8.3.1 Report filing.** A copy of the final report shall be filed with the *building* official and an identical copy shall be maintained in an approved location at the building.

**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.

**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 *building* 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 *building* 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 1022.9, 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 1022.1 and an open exterior balcony or ventilated vestibule

meeting the requirements of this section. Where access to the roof is required by the *Section 1009.13*, 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 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. Openings are not permitted other than the required means of egress doors. The vestibule shall be separated from the stairway by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. The open exterior balcony shall be constructed in accordance with the fire-resistance rating requirements for floor assemblies.

**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 907.3.

**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 m<sup>2</sup>) 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 907.3.

**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 0.10 inches of water (25 Pa) and a maximum of 0.35 inches of water (87 Pa) in the shaft relative to the building measured with all stairway doors closed under maximum anticipated conditions of stack effect and wind effect.

**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 907.3.

**909.20.6.1 Ventilation systems.** Smokeproof enclosure ventilation systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring 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 not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.
3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

**Exceptions:**

1. Control wiring and power wiring utilizing a 2-hour rated cable or cable system.
2. Where encased with not less than 2 inches (51 mm) of concrete.

**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 403.4.7 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

**910.1 General.** Where required by this code or otherwise installed, smoke and heat vents, ~~or~~ mechanical smoke exhaust systems, *manually activated 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, smoke and heat vents shall not be required within these areas.

**910.2 Where required.** Smoke and heat vents, *an approved mechanical smoke exhaust system, or an approved manually activated smoke exhaust system* shall be installed in the roofs of one-story buildings or portions thereof occupied for the uses set forth in Sections 910.2.1 and 910.2.3.

**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 m<sup>2</sup>) in undivided area.

**Exception:** Group S-1 aircraft repair hangars.

**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 *Chapter 23 of the fire code*.

**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 travel distance is increased in accordance with Section 1016.3.*

**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.

**910.3.1 Design.** Smoke and heat vents shall be listed and labeled to indicate compliance with UL 793.

**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.

**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.

**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.

**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.

**910.3.3 Vent dimensions.** The effective venting area shall not be less than 16 square feet (1.5 m<sup>2</sup>) with no dimension less than 4 feet (1219 mm), excluding ribs or gutters having a total width not exceeding 6 inches (152 mm).

**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 barriers. Vents shall be uniformly located within the roof in the areas of the building where the vents are required to be installed by Section 910.2 with consideration given to roof pitch, draft curtain location, sprinkler location and structural members.

**910.3.5 Draft curtains.** Where required by Table 910.3, draft curtains shall be installed on the underside of the roof 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 non-ESFR sprinklers.

**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.

**TABLE 910.3**

**REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT  
VENTS<sup>a</sup>**

OCCUPANCY GROUP AND COMMODITY CLASSIFICATION	DESIGNATED STORAGE HEIGHT (feet)	MINIMUM DRAFT CURTAIN DEPTH (feet)	MAXIMUM AREA FORMED BY DRAFT CURTAINS (square feet)	VENT-AREATO-FLOOR-AREA RATIO <sup>c</sup>	MAXIMUM SPACING OF VENT CENTERS (feet)	MAXIMUM DISTANCE FROM VENTS TO WALL OR DRAFT CURTAIN <sup>b</sup> (feet)
Group F-1 and S-1	—	$0.2 \times H^d$ but $\geq 4$	50,000	1:100	120	60
High-piled Storage (see Section 910.2.2) Class I-IV commodities (Option 1)	$\leq 20$	6	10,000	1:100	100	60
	$> 20 \leq 40$	6	8,000	1:75	100	55
High-piled Storage (see Section 910.2.2) Class I-IV commodities (Option 2)	$\leq 20$	4	3,000	1:75	100	55
	$> 20 \leq 40$	4	3,000	1:50	100	50
High-piled Storage (see Section 910.2.2) High-hazard commodities (Option 1)	$\leq 20$	6	6,000	1:50	100	50
	$> 20 \leq 30$	6	6,000	1:40	90	45
High-piled Storage (see Section 910.2.2) High-hazard commodities (Option 2)	$\leq 20$	4	4,000	1:50	100	50
	$> 20 \leq 30$	4	2,000	1:30	75	40

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

- Additional requirements for rack storage heights in excess of those indicated shall be in accordance with Chapter 23 of the fire code. For solid-piled storage heights in excess of those indicated, an approved engineered design shall be used.
- Vents adjacent to walls or draft curtains shall be located within a horizontal distance not greater than the maximum distance specified in this column as measured perpendicular to the wall or draft curtain that forms the perimeter of the draft curtained area.
- 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).
- “H” is the height of the vent, in feet, above the floor.

**910.3.5.2 Location and depth.** The location and minimum depth of draft curtains shall be in accordance with Table 910.3.

**910.4 Mechanical smoke exhaust.** Where approved by the *building* official, engineered mechanical smoke exhaust shall be an acceptable alternate to smoke and heat vents.

**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).

**910.4.2 Size.** Fans shall have a maximum individual capacity of 30,000 cfm (14.2 m<sup>3</sup>/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 (m<sup>3</sup>/s).

A = Area of roof vents provided in square feet (m<sup>2</sup>) in accordance with Table 910.3.

**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.

**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 not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

**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. Openings for supply air shall be uniformly distributed around the periphery of the area served.

**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.

**910.5 Manually activated smoke exhaust system.** *A manually activated smoke exhaust system shall be an acceptable alternate to smoke and heat vents and to allow for the increased travel distance option provided in Section 1016.3.*

**910.5.1 Location.** *Exhaust fans shall be uniformly spaced throughout the Group F-1 or S-1 portion of the building.*

**910.5.2 Size.** *Fans shall have a maximum individual capacity of 50,000 cubic feet per minute (cfm) and provide a minimum of two air changes per hour.*

**910.5.3 Operation.** *Smoke exhaust fans shall be manually activated by individual manual controls.*

**910.5.4 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 1000 degrees F (538 degrees 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 not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.*

**910.5.5 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. Supply air for exhaust fans shall be uniformly distributed around the periphery of the area served.*

**910.5.6 Interlocks.** *Combination comfort air-handling/manually activated smoke exhaust systems are permitted. In combination comfort air-handling/manually activated smoke exhaust systems or independent comfort air-handling systems, the comfort air-handling system fans shall be controlled to automatically shut down upon duct or area smoke detector activation or sprinkler system water flow as specified in the approved manually activated smoke exhaust system sequence of operation.*

## SECTION 911

### FIRE COMMAND CENTER

**911.1 General.** Where required by other sections of this code and in all buildings classified as high-rise buildings by this code, a fire command center for fire department operations shall be provided and shall comply with Sections 911.1.1 through 911.1.5.

**911.1.1 Location and access.** The location and accessibility of the fire command center shall be approved by the *building official with input from the fire chief.*

**911.1.2 Separation.** 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 707 or horizontal assembly constructed in accordance with Section 712, or both.

**911.1.3 Size.** The room shall be a minimum of 200 square feet (19 m<sup>2</sup>) with a minimum dimension of 10 feet (3048 mm).

**911.1.4 Layout approval.** A layout of the fire command center and all features required by this section to be contained therein shall be submitted for approval prior to installation.

**911.1.5 Required features.** The fire command center shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air distribution 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 waterflow 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 and the location of fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

## **SECTION 912 FIRE DEPARTMENT CONNECTIONS**

**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.

**Exceptions:** *Fire department connections are not required for:*

1. *Limited area sprinkler systems supplied from the domestic water system.*
2. *Automatic sprinkler systems having less than 20 sprinklers.*

**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 by the *building official with input from the fire chief*.

**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 *building official with input from the fire chief*.

**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 *building official*.

**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 fixed or moveable object. Access to fire department connections shall be approved by the *building official with input from the fire chief*.

**Exception:** Fences, where provided with an access gate equipped with a sign complying with the legend requirements of Section 912.4 and a means of emergency operation. The gate and the means of emergency operation shall be approved by the *building official with input from the fire chief* and maintained operational at all times.

**912.3.1 Locking fire department connection caps.**

The *building 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.

**912.3.2 Clear space around connections.** A working space of not less than 36 inches (762 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height shall be provided and maintained in front of and to the sides of wall-mounted fire department connections and around the circumference of free-standing fire department connections, except as otherwise required or approved by the *building official with input from the fire chief*.

**912.3.3 Physical protection.** Where fire department connections are subject to impact by a motor vehicle, vehicle impact protection shall be provided in accordance with Section 312 of the *fire code*.

**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 or STANDPIPES or TEST CONNECTION or a combination thereof as applicable. Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.

**912.5 Backflow protection.** The potable water supply to automatic sprinkler and standpipe systems shall be protected against backflow as required by the *plumbing code*.

## **SECTION 913 FIRE PUMPS**

**913.1 General.** Where provided, fire pumps shall be installed in accordance with this section and NFPA 20.

**913.1.1 Minimum suction pressure to be maintained.** *When a fire pump is installed, the "Ohio Environmental Protection Agency" requires the installation of a low pressure cut-off or a low suction throttling valve to ensure that a minimum of 10 psi is maintained in the suction line while the pump is operating (see rule 3745-95-07 of the Administrative Code).*

**913.2 Protection against interruption of service.** The fire pump, driver and controller shall be protected in accordance with NFPA 20 against possible interruption of service through damage caused by explosion, fire, flood, earthquake, rodents, insects, windstorm, freezing, vandalism and other adverse conditions.

**913.2.1 Protection of fire pump rooms.** Fire pumps shall be located in rooms that are separated from all other areas of the building by 2-hour fire barriers constructed in accordance with Section 707 or 2-hour horizontal assemblies constructed in accordance with Section 712, or both.

### **Exceptions:**

1. In other than high-rise buildings, separation by 1-hour fire barriers constructed in accordance with Section 707 or 1-hour horizontal assemblies constructed in accordance with Section 712, or both, shall be permitted in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Separation is not required for fire pumps physically separated in accordance with NFPA 20.

**913.3 Temperature of pump room.** Suitable means shall be provided for maintaining the temperature of a pump room or pump house, where required, above 40°F (5°C).

**913.3.1 Engine manufacturer's recommendation.** Temperature of the pump

room, pump house or area where engines are installed shall never be less than the minimum recommended by the engine manufacturer. The engine manufacturer's recommendations for oil heaters shall be followed.

**913.4 Valve supervision.** Where provided, the fire pump suction, discharge and bypass valves, and isolation valves on the backflow prevention device or assembly shall be supervised open by one of the following methods:

1. Central-station, proprietary or remote-station signaling service.
2. Local signaling service that will cause the sounding of an audible signal at a constantly attended location.
3. Locking valves open.
4. Sealing of valves and approved weekly recorded inspection where valves are located within fenced enclosures under the control of the owner.

**913.4.1 Test outlet valve supervision.** Fire pump test outlet valves shall be supervised, *sealed, or locked* in the closed position.

**913.5 Acceptance test.** Acceptance testing shall be done in accordance with the requirements of NFPA 20 and *Section 901.5*.

## **SECTION 914 EMERGENCY RESPONDER SAFETY FEATURES**

**914.1 Shaftway markings.** Vertical shafts shall be identified as required by Sections 914.1.1 and 914.1.2

**914.1.1 Exterior access to shaftways.** Outside openings accessible to the fire department and that open directly on a hoistway or shaftway communicating between two or more floors in a building shall be plainly marked with the word "SHAFTWAY" in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible from the outside of the building.

**914.1.2 Interior access to shaftways.** Door or window openings to a hoistway or shaftway from the interior of the building shall be plainly marked with the word "SHAFTWAY" in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible.

**Exception:** Markings shall not be required on shaftway openings that are readily discernible as openings onto a shaftway by the construction or arrangement.

**914.2 Equipment room identification.** Fire protection equipment shall be identified in an approved manner. Rooms containing controls for air-conditioning

systems, sprinkler risers and valves or other fire detection, suppression or control elements shall be identified for the use of the fire department. Approved signs required to identify fire protection equipment and equipment location shall be constructed of durable materials, permanently installed and readily visible.

**SECTION 915**  
**EMERGENCY RESPONDER RADIO COVERAGE**

**915.1 General.** Emergency responder radio coverage shall be provided in all new buildings in accordance with Section 510 of the *fire code*.

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Certification

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7/1/06, 7/1/07, 1/1/09, 11/1/11

**4101:1-10-01 Means of egress.**

*[Comment: When a reference is made within this rule to a federal statutory provision, an industry consensus standard, or any other technical publication, the specific date and title of the publication as well as the name and address of the promulgating agency are listed in rule 4101:1-35-01 of the Administrative Code. The application of the referenced standards shall be limited and as prescribed in section 102.5 of rule 4101:1-1-01 of the Administrative Code.]*

**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. *Where Chapter 11 and this chapter have provisions relating to the same content, both chapters shall apply.*

**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 *fire code*.

**1001.4 Fire safety and evacuation plans.** *Fire safety and evacuation plans shall be provided for all occupancies and buildings where required by the fire code. Such fire safety and evacuation plans shall comply with the applicable provisions of Sections 401.2 and 404 of the fire code.*

**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 unenclosed 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 supported on a dedicated structural system and two or more rows high and is not a building element (see “Grandstands”).

**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 semi-counter balanced 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 between the exit access and the exit discharge or public way. Exit components include exterior exit doors at the level of exit discharge, interior exit stairways, interior exit ramps, exit passageways, exterior exit stairways and exit ramps and horizontal exits.*

**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 ACCESS DOORWAY.** A door or access point along the path of egress travel from an occupied room, area or space where the path of egress enters an intervening room, corridor, exit access stair or exit access ramp.

**EXIT ACCESS RAMP.** *An interior ramp that is not a required interior exit*

*ramp.*

**EXIT ACCESS STAIRWAY.** *An interior stairway that is not a required interior exit stairway.*

**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 story at the point at which an exit terminates and an exit discharge begins.

**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, 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 PASSAGEWAY.** 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 horizontal direction to the exit discharge or the public way.

**FIRE EXIT HARDWARE.** Panic hardware that is listed for use on fire door assemblies.

**FIXED SEATING.** *Furniture or fixture designed and installed for the use of sitting and secured in place including bench-type seats with or without backs or arm rests.*

**FLIGHT.** A continuous run of rectangular treads, winders or combination thereof from one landing to another.

**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 having an overall shape and size that is capable of being reduced for purposes of moving or storing and is not a building element.

**GRANDSTAND.** Tiered seating supported on a dedicated structural system and two or more rows high and is not a building element (see “Bleachers”).

**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.

***INTERIOR EXIT RAMP.*** *An exit component that serves to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance, and provides for a protected path of egress travel to the exit discharge or public way.*

***INTERIOR EXIT STAIRWAY.*** *An exit component that serves to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance, and provides for a protected path of egress travel to the exit discharge or public way.*

**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.

**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.

**PHOTOLUMINESCENT.** Having the property of emitting light that continues for a length of time after excitation by visible or invisible light has been removed.

**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.

**SELF-LUMINOUS.** Illuminated by a self-contained power source, other than batteries, and operated independently of external power sources.

**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.

**SUITE.** *When used in provisions of this code relating to I-2 occupancies,* a group of patient treatment rooms or patient sleeping rooms where staff are in attendance within the suite, for supervision of all patients within the suite and the suite is in compliance with the requirements of Sections 1014.2.2 through 1014.2.7.

**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.
6. Ramp headroom in accordance with Section 1010.5.2.
7. The clear height of floor levels in vehicular and pedestrian traffic areas in parking garages in accordance with Section 406.2.2.
8. Areas above and below mezzanine floors in accordance with Section 505.1.

**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 Post-mounted 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 (686 mm) maximum or 80 inches (2032 mm) minimum above the finished floor or ground.

**Exception:** These requirements shall not apply to sloping portions of handrails between the top and bottom riser of stairs and above the ramp run.

**1003.3.3 Horizontal projections.** Structural elements, fixtures or furnishings shall not project horizontally from either side more than 4 inches (102 mm) over any walking surface between the heights of 27 inches (686 mm) and 80 inches (2032 mm) above the walking surface.

**Exception:** Handrails are permitted to protrude 4 ½ inches (114 mm) from the wall.

**1003.3.4 Clear width.** Protruding objects shall not reduce the minimum clear width of accessible routes.

**1003.4 Floor surface.** Walking surfaces of the means of egress shall have a slip-resistant surface and be securely attached.

**1003.5 Elevation change.** Where changes in elevation of less than 12 inches (305 mm) exist in the means of egress, sloped surfaces shall be used. Where the slope is greater than one unit vertical in 20 units horizontal (5-percent slope), ramps complying with Section 1010 shall be used. Where the difference in elevation is 6 inches (152 mm) or less, the ramp shall be equipped with either handrails or floor finish materials that contrast with adjacent floor finish materials.

**Exceptions:**

1. A single step with a maximum riser height of 7 inches (178 mm) is permitted for buildings with occupancies in Groups F, H, R-2, R-3, S and U at exterior doors not required to be accessible by Chapter 11.
2. A stair with a single riser or with two risers and a tread is permitted at locations not required to be accessible by Chapter 11, provided that the risers and treads comply with Section 1009.4, the minimum depth of the tread is 13 inches (330 mm) and at least one handrail complying with Section 1012 is provided within 30 inches (762 mm) of the centerline of the normal path of egress travel on the stair.
3. A step is permitted in aisles serving seating that has a difference in elevation less than 12 inches (305 mm) at locations not required to be accessible by Chapter 11, provided that the risers and treads comply with Section 1028.11 and the aisle is provided with a handrail complying with

### Section 1028.13.

Throughout a story in a Group I-2 occupancy, any change in elevation in portions of the *means of egress* that serve non-ambulatory persons shall be by means of a ramp or sloped walkway.

**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.

**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 m<sup>2</sup>) 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.

**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.

*The occupant load of wheelchair spaces and the associated companion seat shall be based on one occupant for each wheelchair space and one occupant for the associated companion seat provided in accordance with Section 1108.2.3.*

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. Outdoor areas *dedicated to individual dwelling units* in Group R-3 and Group R-2.

**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	7 net
Concentrated (chairs only—not fixed)	5 net
Standing space 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	35 net
Dormitories	50 gross

Educational Classroom area Shops and other vocational room areas	20 net 50 net
Exercise rooms	50 gross
H-5 Fabrication and manufacturing areas	200 gross
Industrial areas	100 gross
Institutional areas Inpatient treatment areas Outpatient areas Sleeping areas	240 gross 100 gross 120 gross
Kitchens, commercial	200 gross
Library Reading rooms Stack area	50 net 100 gross
Locker rooms	50 gross
Mercantile Areas on other floors Basement and grade floor areas Storage, stock, shipping areas	60 gross 30 gross 300 gross
Parking garages	200 gross
Residential	200 gross
Skating rinks, swimming pools Rink and pool Decks	50 gross 15 gross
Stages and platforms	15 net
Warehouses	500 gross

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

**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 0.3 inches (7.62 mm) per occupant for stairways and by 0.2 inches (5.08 mm) per occupant for other egress components. The width shall not be 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 1028.

**1005.2 Door encroachment.** Doors, when fully opened, and handrails shall not reduce the required means of egress 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 shall be permitted to project into the required width a maximum of 1½ inches (38 mm) on each side.

**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.

**1005.3 Door hardware encroachment.** Surface-mounted latch release hardware shall be exempt from inclusion in the 7-inch (178 mm) maximum projection requirement of Section 1005.2 when:

- 1.The hardware is mounted to the side of the door facing the corridor width when the door is in the open position; and
- 2.The hardware is mounted not less than 34 inches (865 mm) or more than 48 inches (1220 mm) above the finished floor.

**1005.4 Other projections.** *Handrail projections shall be in accordance with the provisions of Section 1012.8. Other nonstructural projections such as trim and similar decorative features shall be permitted to project into the required width a maximum of 1½ inches (38 mm) on each side.*

**Exception:** *Projections are permitted in corridors within Group I-2 nursing homes in accordance with Section 407.3.3.*

## **SECTION 1006 MEANS OF EGRESS ILLUMINATION**

**1006.1 Illumination required.** The means of egress, including the exit discharge, shall be illuminated at all times the building space served by the means of egress is occupied.

**Exceptions:**

1. Occupancies in Group U.
2. Aisle accessways in Group A.

3. Dwelling units and sleeping units in Groups R-1, R-2 and R-3.
4. Sleeping units of Group I occupancies.

**1006.2 Illumination level.** The means of egress illumination level shall not be less than 1 foot-candle (11 lux) at the walking surface.

**Exception:** For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances to not less than 0.2 foot-candle (2.15 lux), provided that the required illumination is automatically restored upon activation of a premises' fire alarm system where such system is provided.

**1006.3 Illumination emergency power.** The power supply for means of egress illumination shall normally be provided by the premises' electrical supply.

In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:

1. Aisles and unenclosed egress stairways in rooms and spaces that require two or more means of egress.
2. Corridors, exit enclosures, *ramps* and exit passageways in buildings required to have two or more exits.
3. Exterior egress components at other than their levels of exit discharge until exit discharge is accomplished for buildings required to have two or more exits.
4. Interior exit discharge elements, as permitted in Section 1027.1, in buildings required to have two or more exits.
5. Exterior landings as required by Section 1008.1.6 for exit discharge doorways in buildings required to have two or more exits.

The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Chapter 27.

**1006.4 Performance of system.** Emergency lighting facilities shall be arranged to provide initial illumination that is at least an average of 1 foot-candle (11 lux) and a minimum at any point of 0.1 foot-candle (1 lux) measured along the path of egress at floor level. Illumination levels shall be permitted to decline to 0.6 foot-candle (6 lux) average and a minimum at any point of 0.06 foot-candle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded.

## SECTION 1007

## ACCESSIBLE MEANS OF EGRESS

**1007.1 Accessible means of egress required.** Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress are required by Section 1015.1 or 1021.1 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

### Exceptions:

1. Accessible means of egress are not required in alterations to existing buildings.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1007.3, 1007.4 or 1007.5.
3. In assembly areas with sloped or stepped aisles, one accessible means of egress is permitted where the common path of travel is accessible and meets the requirements in Section 1028.8.

**1007.2 Continuity and components.** Each required accessible means of egress shall be continuous to a public way and shall consist of one or more of the following components:

1. Accessible routes complying with Section 1104.
2. Interior exit stairways complying with Sections 1007.3 and 1022.
3. Exterior exit stairways complying with Sections 1007.3 and 1026.
4. Elevators complying with Section 1007.4.
5. Platform lifts complying with Section 1007.5.
6. Horizontal exits complying with Section 1025.
7. Ramps complying with Section 1010.
8. Areas of refuge complying with Section 1007.6.

### Exceptions:

1. Where the exit discharge is not accessible, an exterior area for assisted rescue must be provided in accordance with Section 1007.7.
2. Where the exit stairway is open to the exterior, the accessible means of egress shall include either an area of refuge in accordance with Section 1007.6 or an exterior area for assisted rescue in accordance with Section 1007.7.

**1007.2.1 Elevators required.** In buildings where a required accessible floor is four or more stories above or below a level of exit discharge, at least one required accessible means of egress shall be an elevator complying with

#### Section 1007.4.

##### **Exceptions:**

1. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a horizontal exit and located at or above the levels of exit discharge.
2. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a ramp conforming to the provisions of Section 1010.

**1007.3 Stairways.** In order to be considered part of an accessible means of egress, an exit access stairway as permitted by Section 1016.1 or exit stairway shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

##### **Exceptions:**

1. The area of refuge is not required at open exit access or exit stairways as permitted by Sections 1016.1 and 1022.1 in buildings that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The clear width of 48 inches (1219 mm) between handrails is not required at exit access stairway as permitted by Section 1016.1 or exit stairways in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Areas of refuge are not required at exit stairways in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.
5. Areas of refuge are not required at exit stairways serving open parking garages.
6. Areas of refuge are not required for smoke protected seating areas complying with Section 1028.6.2.
7. The areas of refuge are not required in Group R-2 occupancies.

**1007.4 Elevators.** In order to be considered part of an accessible means of egress, an elevator shall comply with the emergency operation and signaling device requirements of Section 2.27 of ASME A17.1. Standby power shall be provided

in accordance with Chapter 27 and Section 3003. The elevator shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

**Exceptions:**

1. Elevators are not required to be accessed from an area of refuge or horizontal exit in open parking garages.
2. Elevators are not required to be accessed from an area of refuge or horizontal exit in buildings and facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Elevators not required to be located in a shaft in accordance with Section 708.2 are not required to be accessed from an area of refuge or horizontal exit.
4. Elevators are not required to be accessed from an area of refuge or horizontal exit for smoke protected seating areas complying with Section 1028.6.2.

**1007.5 Platform lifts.** Platform (wheelchair) lifts shall not serve as part of an accessible means of egress, except where allowed as part of a required accessible route in Section 1109.7. Standby power shall be provided in accordance with Chapter 27 for platform lifts permitted to serve as part of a means of egress.

**1007.5.1 Openness.** Platform lifts on an accessible means of egress shall not be installed in a fully enclosed hoistway .

**1007.6 Areas of refuge.** Every required area of refuge shall be accessible from the space it serves by an accessible means of egress. The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1. Every required area of refuge shall have direct access to a stairway within an exit enclosure complying with Sections 1007.3 and 1022 or an elevator complying with Section 1007.4. Where an elevator lobby is used as an area of refuge, the shaft and lobby shall comply with Section 1022.9 for smokeproof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke barrier.

**Exceptions:**

1. A stairway serving an area of refuge is not required to be enclosed where permitted in Sections 1016.1 and 1022.1.
2. Smokeproof enclosure is not required for an elevator lobby used as an area of refuge not required to be enclosed.

**1007.6.1 Size.** Each area of refuge shall be sized to accommodate one

wheelchair space of 30 inches by 48 inches (762 mm by 1219 mm) for each 200 occupants or portion thereof, based on the occupant load of the area of refuge and areas served by the area of refuge. Such wheelchair spaces shall not reduce the required means of egress width. Access to any of the required wheelchair spaces in an area of refuge shall not be obstructed by more than one adjoining wheelchair space.

**1007.6.2 Separation.** Each area of refuge shall be separated from the remainder of the story by a smoke barrier complying with Section 710 or a horizontal exit complying with Section 1025. Each area of refuge shall be designed to minimize the intrusion of smoke.

**Exception:** Areas of refuge located within an exit enclosure.

**1007.6.3 Two-way communication.** Areas of refuge shall be provided with a two-way communication system complying with Sections 1007.8.1 and 1007.8.2.

**1007.7 Exterior area for assisted rescue.** *Exterior areas for assisted rescue shall be accessed by an accessible route from the area served.* The exterior area for assisted rescue must be open to the outside air and meet the requirements of Section 1007.6.1. Separation walls shall comply with the requirements of Section 705 for exterior walls. Where walls or openings are between the area for assisted rescue and the interior of the building, 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 floor level of the area for assisted rescue or to the roof line, whichever is lower.

**1007.7.1 Openness.** The exterior area for assisted rescue 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.

**1007.7.2 Exterior exit stairway.** Exterior exit stairways that are part of the means of egress for the exterior area for assisted rescue shall provide a clear width of 48 inches (1219 mm) between handrails.

**1007.8 Two-way communication.** A two-way communication system shall be

provided at the elevator landing on each accessible floor that is one or more stories above or below the story of exit discharge complying with Sections 1007.8.1 and 1007.8.2.

**Exceptions:**

1. Two-way communication systems are not required at the elevator landing where the two-way communication system is provided within areas of refuge in accordance with Section 1007.6.3.
2. Two-way communication systems are not required on floors provided with exit ramps conforming to the provisions of Section 1010.

**1007.8.1 System requirements.** Two-way communication systems shall provide communication between each required location and the fire command center or a central control point location approved by the fire department. Where the central control point is not constantly attended, a two-way communication system shall have a timed automatic telephone dial-out capability to a monitoring location or 911. The two-way communication system shall include both audible and visible signals.

**1007.8.2 Directions.** Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system and written identification of the location shall be posted adjacent to the two-way communication system.

**1007.9 Signage.** Signage indicating special accessibility provisions shall be provided as shown:

1. Each door providing access to an area of refuge from an adjacent floor area shall be identified by a sign stating: AREA OF REFUGE.
2. Each door providing access to an exterior area for assisted rescue shall be identified by a sign stating: EXTERIOR AREA FOR ASSISTED RESCUE.

Signage shall comply with the ICC A117.1 requirements for visual characters and include the International Symbol of Accessibility. Where exit sign illumination is required by Section 1011.2, the signs shall be illuminated. Additionally, tactile signage complying with ICC A117.1 shall be located at each door to an area of refuge and exterior area for assisted rescue in accordance with Section 1011.3.

**1007.10 Directional signage.** Direction signage indicating the location of the other means of egress and which are accessible means of egress shall be provided at the following:

1. At exits serving a required accessible space but not providing an approved accessible means of egress.
2. At elevator landings.
3. Within areas of refuge.

**1007.11 Instructions.** In areas of refuge and exterior areas for assisted rescue, instructions on the use of the area under emergency conditions shall be posted. The instructions shall include all of the following:

1. Persons able to use the exit stairway do so as soon as possible, unless they are assisting others.
2. Information on planned availability of assistance in the use of stairs or supervised operation of elevators and how to summon such assistance.
3. Directions for use of the two-way communications system where provided.

## **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 1020.2. Doors provided for egress purposes in numbers greater than required by this code shall meet the requirements of this section.

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 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 ½ inches (1054 mm). The height of door openings 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 *not required to be accessible*, in Group I-3 occupancies, shall have a clear width of not less than 28 inches (711 mm).
3. Door openings to *reach-in* storage closets less than 10 square feet (0.93 m<sup>2</sup>) in area shall not be limited by the minimum width.
4. Width of door leaves in revolving doors that comply with Section 1008.1.4.1 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 (806mm).

**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).

**Exception:** Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the floor.

**1008.1.2 Door swing.** Egress doors shall be of the pivoted or side-hinged swinging type.

**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 1008.1.4.1.
6. In other than Group H occupancies, horizontal sliding doors complying with Section 1008.1.4.3 are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.4.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.
9. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.

Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons or a Group H occupancy.

**1008.1.3 Door opening force.** The force for pushing or pulling open interior swinging egress doors, other than fire doors, shall not exceed 5 pounds (22 N). For other swinging doors, as well as 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.

**1008.1.3.1 Location of applied forces.** Forces shall be applied to the latch side of the door.

**1008.1.4 Special doors.** Special doors and security grilles shall comply with the requirements of Sections 1008.1.4.1 through 1008.1.4.5.

**1008.1.4.1 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 1008.1.4.1.
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.
5. Revolving doors shall not be part of an accessible route required by Section 1007 and Chapter 11.

**TABLE 1008.1.4.1**

### 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.

**1008.1.4.1.1 Egress component.** A revolving door used as a component of a means of egress shall comply with Section 1008.1.4.1 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.

**1008.1.4.1.2 Other than egress component.** A revolving door used as other than a component of a means of egress shall comply with Section 1008.1.4.1. 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.

**1008.1.4.2 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 1008.1.3, 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.

**Exceptions:**

1. Occupancies in Group I-3.
2. Horizontal sliding doors complying with Section 1008.1.4.3.
3. For a bi-parting 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.

**1008.1.4.3 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 in accordance with Section 715.4.8.3, 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.

**1008.1.4.4 Access-controlled egress doors.** The entrance doors in a means of egress in buildings with an occupancy in Group A, B, E, I-2, M, R-1 or R-2 and entrance doors to tenant spaces in occupancies in Groups A, B, E, I-2, 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 automatically 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.

**1008.1.4.5 Security grilles.** In Groups B, F, M 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.

**1008.1.5 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 *fifty* 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 1020.2, 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 <sup>3</sup>/<sub>4</sub> 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. *In units not required to be Type A, Type B or accessible*, variations in elevation due to differences in finish materials, but not more than ½ 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.

**1008.1.6 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) *when the units are not required to be accessible or Type A units.*

**1008.1.7 Thresholds.** Thresholds at doorways shall not exceed  $\frac{3}{4}$  inch (19.1 mm) in height for sliding doors serving dwelling units or  $\frac{1}{2}$  inch (12.7 mm) for other doors. Raised thresholds and floor level changes greater than  $\frac{1}{4}$  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).

**Exception:** The threshold height shall be limited to  $7\frac{3}{4}$  inches (197 mm) where the occupancy is Group R-2 or R-3; the door is an exterior door that is not a component of the required means of egress; the door, other than an exterior storm or screen door, does not swing over the landing or step; and the doorway is not on an accessible route as required by Chapter 11 and is not part of an Accessible unit, Type A unit or Type B unit.

**1008.1.8 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.

**1008.1.9 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.

**1008.1.9.1 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.

**1008.1.9.2 Hardware height.** Door handles, pulls, latches, locks and other operating devices shall be installed 34 inches (864 mm) minimum and 48 inches (1219 mm) maximum above the finished floor. Locks used only for security purposes and not used for normal operation are permitted at any height.

**Exception:** Access doors or gates in barrier walls and fences protecting pools, spas and hot tubs shall be permitted to have operable parts of the release of latch on self-latching devices at 54 inches (1370 mm) maximum above the finished floor or ground, provided the self-latching devices are not also self-locking devices operated by means of a key, electronic opener or integral combination lock.

**1008.1.9.3 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; and
  - 2.3 The use of the key-operated locking device is revocable 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.
5. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.

**1008.1.9.4 Bolt locks.** Manually operated flush bolts or surface bolts are not permitted.

**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.
  3. Where a pair of doors serves an occupant load of less than 50 persons in a Group B, F or S occupancy, manually operated edge-or surface-mounted bolts are permitted on the inactive leaf. The inactive leaf shall contain no doorknobs, panic bars or similar operating hardware.
  4. Where a pair of doors serves a Group B, F or S occupancy, manually operated edge-or surface-mounted bolts are permitted on the inactive leaf provided such inactive leaf is not needed to meet egress width requirements and the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. The inactive leaf shall contain no doorknobs, panic bars or similar operating hardware.
  5. Where a pair of doors serves patient care rooms in Group I-2 occupancies, self-latching edge-or surface-mounted bolts are permitted on the inactive leaf provided that the inactive leaf is not needed to meet egress width requirements and the inactive leaf contains no doorknobs, panic bars or similar operating hardware.

**1008.1.9.5 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 1008.1.9.4.
3. Doors with automatic flush bolts as permitted by Section 1008.1.9.3, Exception 3.
4. Doors from individual dwelling units and sleeping units of Group R occupancies as permitted by Section 1008.1.9.3, Exception 4.

**1008.1.9.5.1 Closet and bathroom doors in Groups I-1 and R-4 occupancies.**

In Group I-1 and R-4 occupancies, closet doors that latch in the closed position shall be *operable* from inside the closet, and bathroom doors that latch in the closed position shall be capable of being unlocked from the ingress side.

**1008.1.9.6 Special egress locks for Group I-2.** Approved *controlled egress locks in accordance with this section* or delayed egress locks *in accordance with Section 1008.1.9.7.1* shall be permitted in a Group I-2 occupancy where the clinical needs of persons receiving care require such locking. *Controlled egress locks* shall be permitted in such occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section

903.3.1.1 *and* an approved automatic smoke or heat detection system installed *throughout the locked space* in accordance with *NFPA 72*, 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 *special* 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 an approved manual keypad located on each side of the door, at staff locations on that floor and a signal from the fire command center.*
4. *Once the door lock has been released, relocking shall be by manual means only.*
5. *A sign shall be provided on the door located above and within 12 inches (305 mm) of the release device reading: **THESE DOORS ARE ELECTRONICALLY CONTROLLED.***
6. *Emergency lighting shall be provided at the door.*

**1008.1.9.7 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 delayed egress locking system shall be permitted to be installed in an I-2 occupancy when installed in accordance with section 1008.1.9.7.1.* 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.

**1008.1.9.7.1 Delayed egress locks in I-2 occupancies.** *Delayed egress locks shall be permitted in I-2 occupancies where the clinical needs of persons receiving care require such locking and where the building is 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 special 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, a nursing station or other approved location.*
4. *The procedures for the operation(s) of the unlocking system shall be described and approved as part of the emergency planning and preparedness required by Chapter 4 of the fire code.*
5. *All clinical staff shall have the keys, codes or other means necessary to operate the locking devices.*
6. *Emergency lighting shall be provided at the door.*

**Exception:** *Items 1 through 3 shall not apply to doors to areas where persons, because of clinical needs, require restraint or containment as part of the function of a mental hospital.*

#### **1008.1.9.8 Electromagnetically locked egress doors.**

Doors in the means of egress that are not otherwise required to have panic hardware in buildings with an occupancy in Group A, B, E, M, R-1 or R-2 and doors to tenant spaces in Group A, B, E, M, R-1 or R-2 shall be permitted to be electromagnetically locked if equipped with listed hardware that incorporates a

built-in switch and meet the requirements below:

1. The listed hardware that is affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The listed hardware is capable of being operated with one hand.
3. Operation of the listed hardware releases to the electromagnetic lock and unlocks the door immediately.
4. Loss of power to the listed hardware automatically unlocks the door.

**1008.1.9.9 Locking arrangements in correctional facilities.** In occupancies in Groups A-2, A-3, A-4, B, E, F, I-2, I-3, M and S within correctional and detention facilities, doors in means of egress serving rooms or spaces occupied by persons whose movements are controlled for security reasons shall be permitted to be locked when equipped with egress control devices which shall unlock manually and by at least one of the following means:

1. Activation of an automatic sprinkler system installed in accordance with Section 903.3.1.1;
2. Activation of an approved manual alarm box; or
3. A signal from a constantly attended location.

**1008.1.9.10 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 403.5.3.
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.

**1008.1.10 Panic and fire exit hardware.** Doors serving a Group H occupancy and doors serving rooms or spaces with an occupant load of 50 or more in a Group A or E 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

#### 1008.1.9.3, 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 or exit access doors shall be equipped with panic hardware or fire exit hardware. The doors shall swing in the direction of egress travel.

**1008.1.10.1 Installation.** Where panic or fire exit hardware is installed, it shall comply with the following:

1. Panic hardware shall be listed in accordance with UL 305;
2. Fire exit hardware shall be listed in accordance with UL 10C and UL 305;
3. The actuating portion of the releasing device shall extend at least one-half of the door leaf width; and
4. The maximum unlatching force shall not exceed 15 pounds (67 N).

**1008.1.10.2 Balanced doors.** 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 m<sup>2</sup>) 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 1027.6 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<sup>1</sup>/<sub>2</sub> 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 1007.3 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 1009.9.
3. Aisle stairs complying with Section 1028.
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.

**Exceptions:**

1. Spiral stairways complying with Section 1009.9 are permitted a 78-inch (1981 mm) headroom clearance.
2. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; where the nosings of treads at the side of a flight extend under the edge of a floor opening through which the stair passes, the floor opening shall be allowed to project horizontally into the required headroom a maximum of 4 <sup>3</sup>/<sub>4</sub> inches (121 mm).

**1009.3 Walkline.** The walkline across winder treads shall be concentric to the direction of travel through the turn and located 12 inches (305 mm) from the side where the winders are narrower. The 12-inch (305 mm) dimension shall be measured from the widest point of the clear stair width at the walking surface of the winder. If winders are adjacent within the flight, the point of the widest clear stair width of the adjacent winders shall be used.

**1009.4 Stair treads and risers.** Stair treads and risers shall comply with Sections 1009.4.1 through 1009.4.5.

**1009.4.1 Dimension reference surfaces.** For the purpose of this section, all dimensions are exclusive of carpets, rugs or runners.

**1009.4.2 Riser height and tread depth.** Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. The riser height shall be measured vertically between the leading edges of adjacent treads. Rectangular tread depths shall be 11 inches (279 mm) minimum 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 between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline and a minimum tread depth of 10 inches (254 mm) within the clear width of the stair.

**Exceptions:**

1. Alternating tread devices in accordance with Section 1009.10.
2. Ship ladders in accordance with Section 1009.11.
3. Spiral stairways in accordance with Section 1009.9.
4. 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 1028.11.2.
5. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the maximum riser height shall be  $8\frac{1}{4}$  inches (197 mm); the minimum tread depth shall be 9 inches (254 mm); the minimum winder tread depth at the walkline shall be 10 inches (254 mm); and the minimum winder tread depth shall be 6 inches (152 mm). A nosing not less than  $\frac{3}{4}$  inch (19.1 mm) but not more than  $1\frac{1}{4}$  inches (32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).
6. See Section 3404.1 for the replacement of existing stairways.
7. In Group I-3 facilities, stairways providing access to guard towers, observation stations and control rooms, not more than 250 square feet ( $23\text{ m}^2$ ) in area, shall be permitted to have a maximum riser height of 8 inches (203 mm) and a minimum tread depth of 9 inches (229 mm).

**1009.4.3 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 1009.8.
2. Spiral stairways in accordance with Section 1009.9.

**1009.4.4 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  $\frac{3}{8}$  inch (9.5 mm) in any flight of stairs. The greatest winder tread depth at the walkline within any flight of stairs shall not exceed the smallest by more than  $\frac{3}{8}$  inch (9.5 mm).

**Exceptions:**

1. Nonuniform riser dimensions of aisle stairs complying with Section 1028.11.2.
2. Consistently shaped winders, complying with Section 1009.4.2, 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-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).

**1009.4.5 Profile.** The radius of curvature at the leading edge of the tread shall be not greater than 9/16 inch (14.3 mm). Beveling of nosings shall not exceed 9/16 inch (14.3 mm). Risers shall be solid and vertical or sloped under the tread above from the underside of the nosing above at an angle not more than 30 degrees (0.52 rad) from the vertical. The leading edge (nosing) of treads shall project not more than 1 ¼ 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 or in Group F, H and S occupancies other than areas accessible to the public. There are no restrictions on the size of the opening in the riser.
3. Solid risers are not required for spiral stairways constructed in accordance with Section 1009.9.
4. Solid risers are not required for alternating tread devices constructed in accordance with Section 1009.10.

**1009.5 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. 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. When wheelchair spaces are required on the stairway landing in

accordance with Section 1007.6.1, the wheelchair space shall not be located in the required width of the landing and doors shall not swing over the wheelchair spaces.

**Exception:** Aisle stairs complying with Section 1028.

**1009.6 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.

**1009.6.1 Stairway walking surface.** The walking surface of treads and landings of a stairway shall not be sloped steeper than one unit vertical in 48 units horizontal (2-percent slope) in any direction. Stairway treads and landings shall have a solid surface. Finish floor surfaces shall be securely attached.

**Exceptions:**

1. Openings in stair walking surfaces shall be a size that does not permit the passage of ½ -inch-diameter (12.7 mm) sphere. Elongated opening shall be placed so that the long dimension is perpendicular to the direction of travel.
2. 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 1-1/8 inches (29 mm) cannot pass through the opening.

**1009.6.2 Outdoor conditions.** Outdoor stairways and outdoor approaches to stairways shall be designed so that water will not accumulate on walking surfaces.

**1009.6.3 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 ½ 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.

**1009.7 Vertical rise.** A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings.

**Exceptions:**

1. Aisle stairs complying with Section 1028.
2. Alternating tread devices used as a means of egress shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.

**1009.8 Curved stairways.** Curved stairways with winder treads shall have treads and risers in accordance with Section 1009.4 and the smallest radius shall not be less than twice the required width of the stairway.

**Exception:** 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.

**1009.9 Spiral stairways.** Spiral stairways are permitted to be used as a component in the means of egress only within dwelling units or from a space not more than 250 square feet ( $23 \text{ m}^2$ ) in area and serving not more than five occupants, or from galleries, catwalks and gridirons in accordance with Section 1015.6.

A spiral stairway shall have a  $7 \frac{1}{2}$ -inch (191 mm) minimum clear tread depth at a point 12 inches (305 mm) from the narrow edge. The risers shall be sufficient to provide a headroom of 78 inches (1981 mm) minimum, but riser height shall not be more than  $9 \frac{1}{2}$  inches (241 mm). The minimum stairway clear width at and below the handrail shall be 26 inches (660 mm).

**1009.10 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 ( $23 \text{ m}^2$ ) in area and which serves not more than five occupants; in buildings of Group I-3 from a guard tower, observation station or control room not more than 250 square feet ( $23 \text{ m}^2$ ) in area and for access to unoccupied roofs.

**1009.10.1 Handrails of alternating tread devices.** Handrails shall be provided on both sides of alternating tread devices and shall comply with Section 1012.

**1009.10.2 Treads of alternating tread devices.** Alternating tread devices shall have a minimum projected tread of 5 inches (127 mm), a minimum tread depth of  $8 \frac{1}{2}$  inches (216 mm), a minimum tread width of 7 inches (178 mm) and a maximum riser height of  $9 \frac{1}{2}$  inches (241 mm). The projected tread depth shall be measured horizontally between the vertical planes of the foremost projections of adjacent treads. The riser height shall be measured vertically between the leading edges of adjacent treads. The combination of riser height and projected tread depth provided shall result in an alternating tread device angle that complies with Section 1002. 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 m<sup>2</sup>) in area which serves not more than five occupants shall have a minimum projected tread of 8 ½ inches (216 mm) with a minimum tread depth of 10 ½ inches (267 mm). The rise to the next alternating tread surface should not be more than 8 inches (203 mm).

**1009.11 Ship ladders.** Ship ladders are permitted to be used in Group I-3 as a component of a means of egress to and from control rooms or elevated facility observation stations not more than 250 square feet (23 m<sup>2</sup>) with not more than three occupants and for access to unoccupied roofs.

Ship ladders shall have a minimum tread depth of 5 inches (127 mm). The tread shall be projected such that the total of the tread depth plus the nosing projection is no less than 8 ½ inches (216 mm). The maximum riser height shall be 9 ½ inches (241 mm).

Handrails shall be provided on both sides of ship ladders. The minimum clear width at and below the handrails shall be 20 inches (508 mm).

**1009.12 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. Handrails for aisle stairs are not required where permitted by Section 1028.13.
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. Changes in room elevations of three or fewer risers within dwelling units and sleeping units in Group R-2 and R-3 do not require handrails.

**1009.13 Stairway to roof.** In buildings four or more stories above grade plane, one stairway shall extend to the roof surface, unless the roof has a slope steeper than four units vertical in 12 units horizontal (33-percent slope). In buildings

without an occupied roof, access to the roof from the top story shall be permitted to be by an alternating tread device.

**1009.13.1 Roof access.** Where a stairway is provided to a roof, access to the roof shall be provided through a penthouse complying with Section 1509.2.

**Exception:** In buildings without an occupied roof, access to the roof shall be permitted to be a roof hatch or trap door not less than 16 square feet (1.5 m<sup>2</sup>) in area and having a minimum dimension of 2 feet (610 mm).

**1009.13.2 Protection at roof hatch openings.** Where the roof hatch opening providing the required access is located within 10 feet (3049 mm) of the roof edge, such roof access or roof edge shall be protected by guards installed in accordance with the provisions of Section 1013.

**1009.14 Stairway to elevator equipment.** *Deleted.*

## 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 1108.2 through 1108.2.4 and 1108.2.6, ramped aisles within assembly rooms or spaces shall conform with the provisions in Section 1028.11.
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 1010.3 through 1010.9 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-percent slope). The slope of other pedestrian ramps shall not be steeper than one unit vertical in eight units horizontal (12.5-percent slope).

**Exception:** Aisle ramp slope in occupancies of Group A or assembly occupancies accessory to Group E occupancies shall comply with Section 1028.11.

**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 48 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 1018.2. The clear width of a ramp between handrails, if provided, or other permissible projections shall be 36 inches (914 mm) minimum.

**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 and at doors. 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 48 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. In Group R-2 and R-3 individual dwelling and sleeping units that are not required to be Accessible units, Type A units or Type B units in accordance with Section 1107, landings 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.

**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:** In Group R-2 and R-3 individual dwelling or sleeping units that are not required to be Accessible units, Type A units or Type B units in accordance with Section 1107, landings 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 1022.1 through 1022.6 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.

**1010.8 Handrails.** Ramps with a rise greater than 6 inches (152 mm) shall have handrails on both sides. Handrails shall comply with Section 1012.

**Exception:** Handrails for ramped aisles are not required where permitted by Section 1028.13.

**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 the ICC A117.1 curb ramp provisions.
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 drop off of not more than ½ inch (12.7 mm) within 10 inches (254 mm) horizontally of the required landing area.
4. In assembly spaces with fixed seating, edge protection is not required on the sides of ramps where the ramps provide access to the adjacent seating and aisle accessways.

**1010.9.1 Curb, rail, wall or barrier.** A curb, rail, wall or barrier shall be provided to serve as edge protection. A curb must be a minimum of 4 inches (102 mm) in height. Barriers must be constructed so that the barrier 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.** Exits and exit access doors shall be marked by an approved exit sign readily visible from any direction of egress travel. The path of egress travel to exits and within exits shall be marked by readily visible exit signs to clearly indicate the direction of egress travel in cases where the exit or the path of egress travel is not immediately visible to the occupants. Intervening means of egress doors within exits shall be marked by exit signs. Exit sign placement shall be such that no point in an exit access corridor or exit passageway is more than 100 feet (30 480 mm) or the listed viewing distance for the sign, whichever is less, from the nearest visible exit sign.

### **Exceptions:**

1. Exit signs are not required in rooms or areas that require only one exit or exit access.
2. Main exterior exit doors or gates that are obviously and clearly identifiable as exits need not have exit signs where approved by the building official.
3. Exit signs are not required in occupancies in Group U and individual sleeping units or dwelling units in Group R-1, R-2 or R-3.
4. Exit signs are not required in dayrooms, sleeping rooms or dormitories in occupancies in *Group I*.
5. In occupancies in Groups A-4 and A-5, exit signs are not required on the seating side of vomitories or openings into seating areas where exit signs are provided in the concourse that are readily apparent from the vomitories. Egress lighting is provided to identify each vomitory or opening within the seating area in an emergency.

**1011.2 Illumination.** Exit signs shall be internally or externally illuminated.

**Exception:** Tactile signs required by Section 1011.3 need not be provided with illumination.

**1011.3 Tactile exit signs.** A tactile sign stating EXIT and complying with

*Chapter 11* shall be provided adjacent to each door to an area of refuge, an exterior area for assisted rescue, an exit stairway, an exit ramp, an exit passageway and the exit discharge.

**1011.4 Internally illuminated exit signs.** Electrically powered, self-luminous and photoluminescent exit signs shall be listed and labeled in accordance with UL 924 and shall be installed in accordance with the manufacturer's instructions and Chapter 27. Exit signs shall be illuminated at all times.

**1011.5 Externally illuminated exit signs.** Externally illuminated exit signs shall comply with Sections 1011.5.1 through 1011.5.3.

**1011.5.1 Graphics.** Every exit sign and directional exit sign shall have plainly legible letters not less than 6 inches (152 mm) high with the principal strokes of the letters not less than  $\frac{3}{4}$  inch (19.1 mm) wide. The word "EXIT" shall have letters having a width not less than 2 inches (51 mm) wide, except the letter "I," and the minimum spacing between letters shall not be less than  $\frac{3}{8}$  inch (9.5 mm). Signs larger than the minimum established in this section shall have letter widths, strokes and spacing in proportion to their height.

The word "EXIT" shall be in high contrast with the background and shall be clearly discernible when the means of exit sign illumination is or is not energized. If a chevron directional indicator is provided as part of the exit sign, the construction shall be such that the direction of the chevron directional indicator cannot be readily changed.

**1011.5.2 Exit sign illumination.** The face of an exit sign illuminated from an external source shall have an intensity of not less than 5 foot-candles (54 lux).

**1011.5.3 Power source.** Exit signs shall be illuminated at all times. To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the sign illumination means shall be connected to an emergency power system provided from storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Chapter 27.

**Exception:** Approved exit sign illumination means that provide continuous illumination independent of external power sources for a duration of not less than 90 minutes, in case of primary power loss, are not required to be connected to an emergency electrical system.

## 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 1009.12 shall comply with Sections 1012.2 through 1012.9. Handrails required for ramps by Section 1010.8 shall comply with Sections 1012.2 through 1012.8.

**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). Handrail height of alternating tread devices and ship ladders, measured above tread nosings, shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).

**1012.3 Handrail graspability.** All required handrails shall comply with Section 1012.3.1 or shall provide equivalent graspability.

**Exception:** In Group R-3 occupancies; within dwelling units *not required to be accessible, Type A or Type B* in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; handrails shall be Type I in accordance with Section 1012.3.1, Type II in accordance with Section 1012.3.2 or shall provide equivalent graspability.

**1012.3.1 Type I.** Handrails with a circular cross section shall have an outside diameter of at least 1 ¼ inches (32 mm) and not greater than 2 inches (51 mm). If the handrail is not circular, it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6 ¼ inches (160 mm) with a maximum cross-section dimension of 2 ¼ inches (57 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).

**1012.3.2 Type II.** Handrails with a perimeter greater than 6 ¼ inches (160 mm) shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of ¾ inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of at least 5/16 inch (8 mm) within 7/8 inch (22 mm) below the widest portion of the profile. This required depth shall continue for at least 3/8 inch (10 mm) to a level that is not less than 1 ¾ inches (45 mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 ¼ inches (32 mm) to a maximum of 2 ¾ inches (70 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).

**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 turn or landing.
2. Within a dwelling unit, the use of a volute, turnout, starting easing or starting newel is allowed over the lowest tread.
3. Handrail brackets or balusters attached to the bottom surface of the handrail that do not project horizontally beyond the sides of the handrail within 1 ½ inches (38 mm) of the bottom of the handrail shall not be considered obstructions. For each ½ inch (12.7 mm) of additional handrail perimeter dimension above 4 inches (102 mm), the vertical clearance dimension of 1 ½ inches (38 mm) shall be permitted to be reduced by 1/8 inch (3 mm).
4. Where handrails are provided along walking surfaces with slopes not steeper than 1:20, the bottoms of the handrail gripping surfaces shall be permitted to be obstructed along their entire length where they are integral to crash rails or bumper guards.

**1012.5 Fittings.** Handrails shall not rotate within their fittings.

**1012.6 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. 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. The extensions of handrails shall be in the same direction of the stair flights at stairways and the ramp runs at ramps.

**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 *rooms or spaces used for assembly purposes* in accordance with Section 1028.13.
3. Handrails for alternating tread devices and ship ladders are permitted to terminate at a location vertically above the top and bottom risers. Handrails for alternating tread devices are not required to be continuous between flights or to extend beyond the top or bottom risers.

**1012.7 Clearance.** Clear space between a handrail and a wall or other surface shall be a minimum of 1 ½ inches (38 mm). A handrail and a wall or other surface adjacent to the handrail shall be free of any sharp or abrasive elements.

**1012.8 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 ½ 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.

**1012.9 Intermediate handrails.** Stairways shall have intermediate handrails located in such a manner that all portions of the stairway width required for egress capacity are within 30 inches (762 mm) of a handrail. On monumental stairs, handrails shall be located along the most direct path of egress travel.

### **SECTION 1013 GUARDS**

**1013.1 Where required.** Guards shall be located along open-sided walking surfaces, including mezzanines, equipment platforms, stairs, ramps and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Guards shall be adequate in strength and attachment in accordance with 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 1028.14 are permitted and provided.

**1013.1.1 Glazing.** Where glass is used to provide a guard or as a portion of the guard system, the guard shall also comply with Section 2407. Where the glazing provided does not meet the strength and attachment requirements of Section 1607.7, complying guards shall also be located along glazed sides of open-sided walking surfaces.

**1013.2 Height.** Required guards shall be not less than 42 inches (1067 mm) high, measured vertically above the adjacent walking surfaces, adjacent fixed seating or the line connecting the leading edges of the treads.

**Exceptions:**

1. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
2. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.
3. The height in assembly seating areas shall be in accordance with Section 1028.14.
4. Along alternating tread devices and ship ladders, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.

**1013.3 Opening limitations.** Required guards shall not have openings which allow passage of a sphere 4 inches (102 mm) in diameter from the walking surface to the required guard height.

**Exceptions:**

1. *Deleted*
2. The triangular openings at the open sides of a stair, formed by the riser, tread and bottom rail shall not allow passage of a sphere 6 inches (152 mm) in diameter.
3. At elevated walking surfaces for access to and use of electrical, mechanical or plumbing systems or equipment, guards shall not have openings which allow passage of a sphere 21 inches (533 mm) in diameter.
4. In areas that are not open to the public within occupancies in Group I-3, F, H or S, and for alternating tread devices and ship ladders, guards shall not have openings which allow passage of a sphere 21 inches (533 mm) in diameter.
5. In assembly seating areas, guards at the end of aisles where they terminate at a fascia of boxes, balconies and galleries shall not have openings which allow passage of a sphere 4 inches in diameter (102 mm) 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, guards shall not have openings which allow passage of a sphere 8 inches (203 mm) in diameter.

6. *Deleted*

**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 sphere 21 inches (533 mm) in diameter. 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 sphere 21 inches (533 mm) in diameter.

**SECTION 1014  
EXIT ACCESS**

**1014.1 General.** The exit access shall comply with the applicable provisions of Sections 1003 through 1013. Exit access arrangement shall comply with Sections 1014 through 1019.

**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 and the area served are accessory to one or the other, are not a Group H 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. An exit access shall not pass through a room that can be locked to prevent egress.

3. Means of egress from dwelling units or sleeping areas shall not lead through other sleeping areas, toilet rooms or bathrooms.
4. 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.

**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:** The means of egress from a smaller tenant space shall not be prohibited from passing through a larger adjoining tenant space where such rooms or spaces of the smaller tenant occupy less than 10 percent of the area of the larger tenant space through which they pass; are the same or similar occupancy group; a discernable 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.

**Exception:** Rooms with exit doors opening directly to the outside at ground level.

**1014.2.3 Suites in patient sleeping areas.** Patient sleeping areas in Group I-2 occupancies shall be permitted to be divided into suites with one intervening room if one of the following conditions is met:

1. The intervening room within the suite is not used as an exit access for more than eight patient beds.
2. The arrangement of the suite allows for direct and constant visual supervision by nursing personnel.

**1014.2.3.1 Area.** Suites of sleeping rooms shall not exceed 5,000 square feet (465 m<sup>2</sup>).

**1014.2.3.2 Exit access.** Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (93 m<sup>2</sup>) shall have at least two exit access doors remotely located from each other.

**1014.2.3.3 Travel distance.** 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).

**1014.2.4 Suites in areas other than patient sleeping areas.** Areas other than patient sleeping areas in Group I-2 occupancies shall be permitted to be divided into suites.

**1014.2.4.1 Area.** Suites of rooms, other than patient sleeping rooms, shall not exceed 10,000 square feet (929 m<sup>2</sup>).

**1014.2.4.2 Exit access.** Any room or suite of rooms, other than patient sleeping rooms, of more than 2,500 square feet (232 m<sup>2</sup>) shall have at least two exit access doors remotely located from each other.

**1014.2.4.3 One intervening room.** For rooms other than patient sleeping rooms, suites of rooms are 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).

**1014.2.4.4 Two intervening rooms.** 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).

**1014.2.5 Exit access through suites.** Exit access from all other portions of a building not classified as a suite in a Group I-2 occupancy shall not pass through a suite.

**1014.2.6 Travel distance.** The travel distance between any point in a Group I-2 occupancy patient sleeping room and an exit access door in that room shall not exceed 50 feet (15240 mm).

**1014.2.7 Separation.** Suites in Group I-2 occupancies shall be separated from other portions of the building by a smoke partition complying with Section 711.

**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 and assembly occupancies accessory to Group E occupancies having fixed seating, see Section 1028.8.

**Exceptions:**

1. The length of a common path of egress travel in Group B, F 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).

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), provided that the building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

## **SECTION 1015 EXIT AND EXIT ACCESS DOORWAYS**

**1015.1 Exits or exit access doorways from spaces.** Two exits or exit access doorways from any space shall be provided where one of the following conditions exists:

**Exception:** Group I-2 occupancies shall comply with Section 1014.2.2 through 1014.2.7.

1. The occupant load of the space exceeds one of the values in Table 1015.1.

**Exception:** In Group R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

2. The common path of egress travel exceeds one of the limitations of Section 1014.3.
3. Where required by Section 1015.3, 1015.4, 1015.5, 1015.6 or 1015.6.1.

Where a building contains mixed occupancies, each individual occupancy shall comply with the applicable requirements for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.

**TABLE 1015.1  
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY**

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, E <sup>a</sup> , F, M, U	49
H-1, H-2, H-3	3
H-4, H-5, I-1, I-3, I-4, R	10
S	29

a. Day care maximum occupant load is 10.

**1015.1.1 Three or more exits or exit access doorways.**

Three exits or exit access doorways shall be provided from any space with an occupant load of 501 to 1,000. Four exits or exit access doorways shall be provided from any space with an occupant load greater than 1,000.

**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 1018, 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.

**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 ( $46 \text{ m}^2$ ) 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 ( $93 \text{ m}^2$ ) 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 larger than 1,000 square feet ( $93 \text{ m}^2$ ), 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 *mechanical code*.

**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 along the natural and unobstructed path of egress travel to an exterior exit door at the level of exit discharge, an entrance to a vertical exit enclosure, an exit passageway, a horizontal exit, an exterior exit stairway or an exterior exit ramp, shall not exceed the distances given in Table 1016.1.

**Exceptions:**

1. Travel distance in open parking garages is permitted to be measured to the closest riser of open exit stairways.
2. In outdoor facilities with open exit access components and open exterior exit stairways or exit ramps, travel distance is permitted to be measured to the closest riser of an exit stairway or the closest slope of the exit ramp.
3. In other than occupancy Groups H and I, the exit access travel distance to a maximum of 50 percent of the exits is permitted to be measured

from the most remote point within a building to an exit using unenclosed exit access stairways or ramps when connecting a maximum of two stories. The two connected stories shall be provided with at least two means of egress. Such interconnected stories shall not be open to other stories.

4. In other than occupancy Groups H and I, exit access travel distance is permitted to be measured from the most remote point within a building to an exit using unenclosed exit access stairways or ramps in the first and second stories above grade plane in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. The first and second stories above grade plane shall be provided with at least two means of egress. Such interconnected stories shall not be open to other stories.

Where applicable, travel distance on unenclosed exit access stairways or ramps and on connecting stories 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.

**TABLE 1016.1**  
**EXIT ACCESS TRAVEL DISTANCE<sup>a</sup>**

<b>OCCUPANCY</b>	<b>WITHOUT SPRINKLER SYSTEM (feet)</b>	<b>WITH SPRINKLER SYSTEM (feet)</b>
A, E, F-1, M, R, S-1	200	250 <sup>b</sup>
I-1	Not Permitted	250 <sup>c</sup>
B	200	300 <sup>c</sup>
F-2, S-2, U	300	400 <sup>c</sup>
H-1	Not Permitted	75 <sup>c</sup>
H-2	Not Permitted	100 <sup>c</sup>
H-3	Not Permitted	150 <sup>c</sup>
H-4	Not Permitted	175 <sup>c</sup>
H-5	Not Permitted	200 <sup>c</sup>
I-2, I-3, I-4	Not Permitted	200 <sup>c</sup>

For SI: 1 foot = 304.8 mm.

- a. See the following sections for modifications to exit access travel distance requirements:
  - Section 402.4: For the distance limitation in malls.
  - Section 404.9: For the distance limitation through an atrium space.
  - Section 407.4: For the distance limitation in Group I-2.

Sections 408.6.1 and 408.8.1: For the distance limitations in Group I-3.  
 Section 411.4: For the distance limitation in special amusement buildings.  
 Section 1014.2.2: For the distance limitation in Group I-2 hospital suites.  
 Section 1015.4: For the distance limitation in refrigeration machinery rooms.  
 Section 1015.5: For the distance limitation in refrigerated rooms and spaces.  
Section 1016.3: For increased limitation in Groups F-1 and S-1.  
 Section 1021.2: For buildings with one exit.  
 Section 1028.7: For increased limitation in assembly seating.  
 Section 1028.7: For increased limitation for assembly open-air seating.  
 Section 3103.4: For temporary structures.  
 Section 3104.9: For pedestrian walkways.

- 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 are permitted in accordance with Section 903.3.1.2.
- c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

**1016.2 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 1019. The length of such balcony shall not be less than the amount of the increase taken.

**1016.3 Group F-1 and S-1 increase.** *The maximum exit access travel distance shall be 400 feet (121,920 mm) in Group F-1 and S-1 occupancies where all of the following are met:*

1. *The portion of the building classified as Group F-1 or S-1 is limited to one story in height; and*
2. *The minimum height from the finished floor to the bottom of the ceiling or roof slab or deck is 24 feet (7315 mm); and*
3. *The portion of the building classified as Group F-1 or S-1 is equipped throughout with an early suppression fast response (ESFR) automatic fire sprinkler system in accordance with Section 903.3.1.1; and*
4. *The portion of the building classified as Group F-1 or S-1 is equipped with a manually activated smoke exhaust system complying with Section 910.5.*

## SECTION 1017 AISLES

**1017.1 General.** 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 shall comply with Section 1028. Aisles serving reviewing stands, grandstands and bleachers shall also comply with Section 1028. The required width of aisles shall be unobstructed.

**Exception:** Doors complying with Section 1005.2.

**1017.2 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.

**1017.3 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).

**1017.4 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.

**1017.4.1 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 1017.4.2.

**1017.4.2 Table and seating accessway width.** Aisle accessways shall provide a minimum of 12 inches (305 mm) of width plus ½ 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.

**1017.4.3 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.

## SECTION 1018 CORRIDORS

**1018.1 Construction.** Corridors shall be fire-resistance rated in accordance with Table 1018.1. The corridor walls required to be fire-resistance rated shall comply with Section 709 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 opening 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.

**TABLE 1018.1  
CORRIDOR FIRE-RESISTANCE RATING**

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system <sup>c</sup>
H-1, H-2, H-3	All	Not Permitted	1

H-4, H-5	Greater than 30	Not Permitted	1
A, B, E, F, M, S, U	Greater than 30	1	0
R	Greater than 10	Not Permitted <sup>d</sup>	0.5
I-2a, I-4	All	Not Permitted	0
I-1, I-3	All	Not Permitted	1 <sup>b</sup>

- a. For requirements for occupancies in Group I-2, see Sections 407.2 and 407.3.  
b. For a reduction in the fire-resistance rating for occupancies in Group I-3, see Section 408.8.  
c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 where allowed.  
d. One hour when design qualifies in accordance with Section 903.2.8, exception 3.

**1018.2 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.
5. Seventy-two inches (1829 mm)—In corridors and areas serving gurney traffic in occupancies where patients receive 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. Corridors are not required to have a clear width of 96 inches (2438 mm) in areas where there will not be stretcher or bed movement for access to care or as part of the defend in place strategy.

**1018.3 Corridor obstruction.** The required width of corridors shall be unobstructed.

**Exception:** Doors complying with Section 1005.2.

**1018.4 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, E, F, I-1, M, R-1, R-2, R-4, S and U, where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the length of the 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.

**1018.5 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 m<sup>2</sup>) or less in area, utilization of corridors for conveying return air is permitted.
4. Incidental air movement from pressurized rooms within health care facilities, provided that the corridor is not the primary source of supply or return to the room.

**1018.5.1 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 International Mechanical Code;
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.

**1018.6 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 1019 EGRESS BALCONIES**

**1019.1 General.** Balconies used for egress purposes shall conform to the same requirements as corridors for width, headroom, dead ends and projections.

**1019.2 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.

**1019.3 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 1020 EXITS**

**1020.1 General.** Exits shall comply with Sections 1020 through 1026 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.

**1020.2 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.

**1020.2.1 Detailed requirements.** Exterior exit doors shall comply with the applicable requirements of Section 1008.1.

**1020.2.2 Arrangement.** Exterior exit doors shall lead directly to the exit

discharge or the public way.

## SECTION 1021 NUMBER OF EXITS AND CONTINUITY

**1021.1 Exits from stories.** All spaces within each story shall have access to the minimum number of approved independent exits as specified in Table 1021.1 based on the occupant load of the story. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories.

### Exceptions:

1. As modified by Section 403.5.2.
2. As modified by Section 1021.2.
3. Exit access stairways and ramps that comply with Exception 3 or 4 of Section 1016.1 shall be permitted to provide the minimum number of approved independent exits required by Table 1021.1 on each story.
4. In Group R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
5. Within a story, rooms and spaces complying with Section 1015.1 with exits that discharge directly to the exterior at the level of exit discharge, are permitted to have one exit.

**TABLE 1021.1  
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

**1021.1.1 Exits maintained.** The required number of exits from any story shall be maintained until arrival at grade or the public way.

**1021.1.2 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.

**1021.1.3 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 m<sup>2</sup>) in area, the second means of egress is permitted to be a fire escape, alternating tread device or ladder leading to the floor below.

**1021.2 Single exits.** Only one exit shall be required from Group R-3 occupancy buildings or from stories of other buildings as indicated in Table 1021.2. Occupancies shall be permitted to have a single exit in buildings otherwise required to have more than one exit if the areas served by the single exit do not exceed the limitations of Table 1021.2. Mixed occupancies shall be permitted to be served by single exits provided each individual occupancy complies with the applicable requirements of Table 1021.2 for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1. Basements with a single exit shall not be located more than one story below grade plane.

**TABLE 1021.2  
STORIES WITH ONE EXIT**

STORY	OCCUPANCY	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
First story or basement	A, B <sup>d</sup> , E <sup>e</sup> , F <sup>d</sup> , M, U, S <sup>d</sup>	49 occupants and 75 feet travel distance
	H-2, H-3	3 occupants and 25 feet travel distance
	H-4, H-5, I, R	10 occupants and 75 feet travel distance
	S <sup>a</sup>	29 occupants and 100 feet travel distance
Second story	B <sup>b</sup> , F, M, S <sup>a</sup>	29 occupants and 75 feet travel distance
	R-2	4 dwelling units and 50 feet travel distance
Third story	R-2 <sup>c</sup>	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 1021.1.2.
- b. For the required number of exits for air traffic control towers, see Section 412.3.
- 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 1029.
- d. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.
- e. Day care occupancies shall have a maximum occupant load of 10.

**1021.3 Exit continuity.** Exits shall be continuous from the point of entry into the exit to the exit discharge.

**1021.4 Exit door arrangement.** Exit door arrangement shall meet the requirements of Sections 1015.2 through 1015.2.2.

## **SECTION 1022 EXIT ENCLOSURES**

**1022.1 Enclosures required.** Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, 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. Exit enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours. Exit enclosures shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway conforming to the requirements of Section 1023, except as permitted in Section 1027.1. 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 its level of exit discharge; or
  - 1.2 The stairway is open to not more than one story below its 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 in open parking structures that serve only the parking structure are not required to be enclosed.
5. Stairways in Group I-3 occupancies, as provided for in Section 408.3.8, are not required to be enclosed.

6. Means of egress stairways as required by Sections 410.5.3 and 1015.6.1 are not required to be enclosed.
7. Means of egress stairways from balconies, galleries or press boxes as provided for in Section 1028.5.1 are not required to be enclosed.

**1022.2 Termination.** Exit enclosures shall terminate at an exit discharge or a public way.

**Exception:** An exit enclosure shall be permitted to terminate at an exit passageway complying with Section 1023, provided the exit passageway terminates at an exit discharge or a public way.

**1022.2.1 Extension.** Where an exit enclosure is extended to an exit discharge or a public way by an exit passageway, the exit enclosure shall be separated from the exit passageway by a fire barrier constructed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 712, or both. The fire-resistance rating shall be at least equal to that required for the exit enclosure. A fire door assembly complying with Section 715.4 shall be installed in the fire barrier to provide a means of egress from the exit enclosure to the exit passageway. Openings in the fire barrier other than the fire door assembly are prohibited. Penetrations of the fire barrier are prohibited.

**Exception:** Penetrations of the fire barrier in accordance with Section 1022.4 shall be permitted.

**1022.3 Openings and penetrations.** Exit enclosure opening protectives shall be in accordance with the requirements of Section 715.

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.

Elevators shall not open into an exit enclosure.

**1022.4 Penetrations.** Penetrations into and openings through an exit enclosure are prohibited except for required exit doors, equipment and ductwork necessary for independent ventilation or 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 m<sup>2</sup>). Such penetrations shall be protected in accordance with Section 713. There shall be no penetrations or communication openings, whether protected or not, between adjacent exit enclosures.

**1022.5 Ventilation.** Equipment and ductwork for exit enclosure ventilation as permitted by Section 1022.4 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.

**1022.6 Exit enclosure exterior walls.** Exterior walls of an exit enclosure shall comply with the requirements of Section 705 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.

**1022.7 Discharge identification.** A stairway in an exit enclosure shall not continue below its 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.

**1022.8 Floor identification signs.** A sign shall be provided at each floor landing in exit enclosures connecting more than three stories designating the floor level, the terminus of the top and bottom of the exit enclosure and the identification of the stair or ramp. The signage shall also state the story of, and the direction to, the exit discharge and the availability of roof access from the enclosure 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. Floor level identification signs in tactile characters complying with *Chapter 11* shall be located at each floor level landing adjacent to the door leading from the enclosure into the corridor to identify the floor level.

**1022.8.1 Signage requirements.** Stairway identification signs shall comply with *Chapter 11* and all of the following requirements:

1. The signs shall be a minimum size of 18 inches (457 mm) by 12 inches (305 mm).
2. The letters designating the identification of the stair enclosure shall be a minimum of 1 ½ inches (38 mm) in height.
3. The number designating the floor level shall be a minimum of 5 inches (127 mm) in height and located in the center of the sign.
4. All other lettering and numbers shall be a minimum of 1 inch (25 mm) in height.
5. Characters and their background shall have a nonglare finish. Characters shall contrast with their background, with either light characters on a dark background or dark characters on a light background.
6. When signs required by Section 1022.8 are installed in interior exit enclosures of buildings subject to Section 1024, the signs shall be made of the same materials as required by Section 1024.4.

**1022.9 Smokeproof enclosures and pressurized stairways.** In buildings required to comply with Section 403 or 405, each of the exit enclosures serving a story with a floor surface 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 finished floor of a level of exit discharge serving such stories shall be a smokeproof enclosure or pressurized stairway in accordance with Section 909.20.

**1022.9.1 Termination and extension.** A smokeproof enclosure or pressurized stairway shall terminate at an exit discharge or a public way. The smokeproof enclosure or pressurized stairway shall be permitted to be extended by an exit passageway in accordance with Section 1022.2. The exit passageway shall be without openings other than the fire door assembly required by Section 1022.2 and those necessary for egress from the exit passageway. The exit passageway shall be separated from the remainder of the building by 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

**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. The fire barrier separating the smokeproof enclosure or pressurized stairway from the exit passageway is not required, provided the exit passageway is protected and pressurized in the same manner as the smokeproof enclosure or pressurized stairway.
4. A smokeproof enclosure or pressurized stairway shall be permitted to egress through areas on the level of discharge or vestibules as permitted by Section 1027.

**1022.9.2 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 1023 EXIT PASSAGEWAYS**

**1023.1 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.

**1023.2 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 complying with Section 1005.2.

**1023.3 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 707 or horizontal assemblies constructed in accordance with Section 712, or both.

**1023.4 Termination.** Exit passageways shall terminate at an exit discharge or a public way.

**1023.5 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

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 an exit enclosure is extended to an exit discharge or a public way by an exit passageway, the exit passageway shall also comply with Section 1022.2.1.

Elevators shall not open into an exit passageway.

**1023.6 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 m<sup>2</sup>). Such penetrations shall be protected in accordance with Section 713. There shall be no penetrations or communicating openings, whether protected or not, between adjacent exit passageways.

## **SECTION 1024 LUMINOUS EGRESS PATH MARKINGS**

*Deleted*

## **SECTION 1025 HORIZONTAL EXITS**

**1025.1 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 m<sup>2</sup>) of accessible space per occupant shall be provided on each side of the horizontal exit for the total number of people in adjoining compartments.

**1025.2 Separation.** The separation between buildings or refuge areas connected by a horizontal exit shall be provided by a fire wall complying with Section 706;

or it shall be provided by a fire barrier complying with Section 707 or a horizontal assembly complying with Section 712, or both. The minimum fire-resistance rating of the separation shall be 2 hours. Opening protectives in horizontal exits shall also comply with Section 715. Duct and air transfer openings in a fire wall or fire barrier that serves as a horizontal exit shall also comply with Section 716. 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 exits 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.

**1025.3 Opening protectives.** Fire doors in horizontal exits shall be self-closing or automatic-closing when activated by a smoke detector in accordance with Section 715.4.8.3. Doors, where located in a cross-corridor condition, shall be automatic-closing by activation of a smoke detector installed in accordance with Section 715.4.8.3.

**1025.4 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 m<sup>2</sup>) 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 m<sup>2</sup>) per occupant for occupancies in Group I-3.
2. Fifteen square feet (1.4 m<sup>2</sup>) per occupant for ambulatory occupancies in Group I-2.
3. Thirty square feet (2.8 m<sup>2</sup>) per occupant for nonambulatory occupancies in Group I-2.

The refuge 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 load imposed by persons entering it through horizontal exits from

other areas. At least one refuge area exit shall lead directly to the exterior or to an exit enclosure.

**Exception:** The adjoining compartment shall not be required to have a stairway or door leading directly outside, provided the refuge area into which a horizontal exit leads has 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.

## **SECTION 1026 EXTERIOR EXIT RAMPS AND STAIRWAYS**

**1026.1 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 1022.1, Exception 2.

**1026.2 Use in a means of egress.** Exterior exit stairways shall not be used as an element of a required means of egress for *Groups I-2, I-4 and child care facilities in E* occupancies. For occupancies in other than Group I-2, I-4 and child care facilities in E occupancies, exterior exit ramps and stairways shall be permitted as an element of a required means of egress for buildings not exceeding six stories above grade plane or having occupied floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

**1026.3 Open side.** Exterior exit ramps and stairways serving as an element of a required means of egress shall be open on at least one side. An open side shall have a minimum of 35 square feet (3.3 m<sup>2</sup>) of aggregate open area adjacent to each floor level and the level of each intermediate landing. The required open area shall be located not less than 42 inches (1067 mm) above the adjacent floor or landing level.

**1026.4 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.

**1026.5 Location.** Exterior exit ramps and stairways shall be located in accordance with Section 1027.3.

**1026.6 Exterior ramps and stairway protection.** Exterior exit ramps and stairways shall be separated from the interior of the building as required in Section 1022.1. 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 a level of exit discharge serving such occupancies 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 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 1022.1.
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 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 1018.
  - 4.3. The open-ended corridors are connected on each end to an exterior exit ramp or stairway complying with Section 1026.
  - 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 m<sup>2</sup>) 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 1027  
EXIT DISCHARGE**

**1027.1 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. The combined use of Exceptions 1 and 2

below shall not exceed 50 percent of the number and capacity of the required exits.

**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 path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the exit enclosure.
  - 1.2. The entire area of the level of exit 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 exit discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of exit 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 1022.1, Exception 4, are permitted to egress through the open parking garage at their levels of exit discharge.
4. Horizontal exits complying with Section 1025 shall not be required to discharge directly to the exterior of the building.

**1027.2 Exit discharge capacity.** The capacity of the exit discharge shall be not less than the required discharge capacity of the exits being served.

**1027.3 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 705 based on fire separation distance.

**1027.4 Exit discharge components.** Exit discharge components shall be sufficiently open to the exterior so as to minimize the accumulation of smoke and toxic gases.

**1027.5 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 1027.

**1027.5.1 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 complying with Section 1005.2.

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.

**1027.5.2 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.

**1027.6 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 (0.46 m<sup>2</sup>) 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 1028 ASSEMBLY**

**1028.1 General.** Occupancies in Group A and assembly occupancies accessory to Group E which contain seats, tables, displays, equipment or other material shall comply with this section.

**1028.1.1 Bleachers.** Bleachers, grandstands and folding and telescopic seating, that are not building elements, shall comply *with Chapters 1-4 of ICC 300.*

**1028.2 Assembly main exit.** Group A occupancies and assembly occupancies accessory to Group E occupancies that have an occupant load of greater than 300 shall be provided with a main exit. The main exit shall be of sufficient width to accommodate not less than one-half of the occupant load, but such width shall not be less than the total required width of all means of egress leading to the exit. Where the building is classified as a Group A occupancy, the main exit shall front on at least one street or an unoccupied space of not less than 10 feet (3048 mm) in width that adjoins a street or public way.

**Exception:** In assembly occupancies where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building provided that the total width of egress is not less than 100 percent of the required width.

**1028.3 Assembly other exits.** In addition to having access to a main exit, each level in Group A occupancies or assembly occupancies accessory to Group E occupancies having an occupant load greater than 300, shall be provided with additional means of egress that shall provide an egress capacity for at least one-half of the total occupant load served by that level and comply with Section 1015.2.

**Exception:** In assembly occupancies where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building, provided that the total width of

egress is not less than 100 percent of the required width.

**1028.4 Foyers and lobbies.** In Group A-1 occupancies, where persons are admitted to the building at times when seats are not available, such persons shall be allowed to wait in a lobby or similar space, provided such lobby or similar space shall not encroach upon the required clear width of the means of egress. 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.

**1028.5 Interior balcony and gallery means of egress.** For balconies, galleries or press boxes 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, gallery or press box and at least one leading directly to an exit.

**1028.5.1 Enclosure of openings.** Interior stairways and other vertical openings shall be enclosed in an exit enclosure as provided in Section 1022.1, except that stairways are permitted to be open between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, places of religious worship, auditoriums and sports facilities. At least one accessible means of egress is required from a balcony, gallery or press box level containing accessible seating locations in accordance with Section 1007.3 or 1007.4.

**1028.6 Width of means of egress for assembly.** The clear width of aisles and other means of egress shall comply with Section 1028.6.1 where smoke-protected seating is not provided and with Section 1028.6.2 or 1028.6.3 where smoke-protected seating is provided. The clear width shall be measured to walls, edges of seating and tread edges except for permitted projections.

**1028.6.1 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-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.

**1028.6.2 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 1028.6.2. 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, shall be done for a facility utilizing the reduced width requirements of Table 1028.6.2 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 1028.6.3.

**1028.6.2.1 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.

**1028.6.2.2 Roof height.** A smoke-protected assembly seating area with a roof shall have the lowest portion of 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.

**1028.6.2.3 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 m<sup>2</sup>) in area.
3. Outdoor seating facilities where seating and the means of egress in the seating area are essentially open to the outside.

**1028.6.3 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 1028.6.2 for the number of seats in the outdoor smoke-protected assembly where Section 1028.6.2 permits less width.

**1028.7 Travel distance.** Exits and aisles shall be so located that the travel distance to an exit door shall not be greater than 200 feet (60 960 mm) measured along the line of travel in nonsprinklered buildings. Travel distance shall not be more than 250 feet (76 200 mm) 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.

**1028.8 Common path of egress travel.** The common path of egress travel shall not exceed 30 feet (9144 mm) from any seat to a point where an occupant has a choice of two paths of egress travel to two exits.

**Exceptions:**

1. For areas serving less than 50 occupants, the common path of egress travel shall not exceed 75 feet (22 860 mm).
2. For smoke-protected assembly seating, the common path of egress travel shall not exceed 50 feet (15 240 mm).

**TABLE 1028.6.2  
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.

**1028.8.1 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.

**1028.9 Assembly aisles are required.** Every occupied portion of any occupancy in Group A or assembly occupancies accessory to Group E that contains seats, tables, displays, 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 1017.4.

**1028.9.1 Minimum aisle width.** The minimum clear width for aisles 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.

**1028.9.2 Aisle width.** The aisle width shall provide sufficient egress capacity for the number of persons accommodated by the catchment area served by the aisle. The catchment area served by an aisle is that portion of the total space that is served by that section of the aisle. In establishing catchment areas, the assumption shall be made that there is a balanced use of all means of egress, with the number of persons in proportion to egress capacity.

**1028.9.3 Converging aisles.** Where aisles converge to form a single path of egress travel, the required egress capacity of that path shall not be less than the combined required capacity of the converging aisles.

**1028.9.4 Uniform width.** Those portions of aisles, where egress is possible in either of two directions, shall be uniform in required width.

**1028.9.5 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.

**1028.9.6 Assembly aisle obstructions.** There shall be no obstructions in the required width of aisles except for handrails as provided in Section 1028.13.

**1028.10 Clear width of aisle accessways serving seating.** Where seating rows have 14 or fewer seats, the minimum clear aisle accessway width shall not be less than 12 inches (305 mm) measured as 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, 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 arm in the used position.

**Exception:** For seats with folding tablet arms, row spacing is permitted to be determined with the tablet arm in the stored position where the tablet arm when raised manually to vertical position in one motion automatically returns to the stored position by force of gravity.

**1028.10.1 Dual access.** For rows of seating served by aisles or doorways at both ends, there shall not be more than 100 seats per row. The minimum clear width of 12 inches (305 mm) between rows shall be increased by 0.3 inch (7.6 mm) for every additional seat beyond 14 seats, but the minimum clear width is not 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 1028.10.1.

**TABLE 1028.10.1  
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.

**1028.10.2 Single access.** For rows of seating served by an aisle or doorway at only one end of the row, the minimum clear width of 12 inches (305 mm) between rows shall be increased by 0.6 inch (15.2 mm) for every additional seat beyond seven seats, but the minimum clear width is not 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 1028.10.1.

**1028.11 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 1028.11.1 through 1028.11.3.

**1028.11.1 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).

**1028.11.2 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. Riser height nonuniformity shall be limited to the extent necessitated by changes in the gradient of the adjoining seating area to maintain adequate sightlines. Where nonuniformities exceed 0.188 inch (4.8 mm) between adjacent risers, the exact location of such nonuniformities shall be indicated with a distinctive marking stripe on each tread at the nosing or leading edge adjacent to the nonuniform risers. Such stripe shall be a

minimum of 1 inch (25 mm), and a maximum of 2 inches (51 mm), wide. The edge marking stripe shall be distinctively different from the contrasting marking stripe.

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.

**1028.11.3 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.

**1028.12 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.

**1028.13 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.

**Exceptions:**

1. Handrails are not required for ramped aisles having a gradient no greater than one unit vertical in eight units horizontal (12.5-percent slope) and seating on both sides.
2. Handrails are not required if, at the side of the aisle, there is a guard that complies with the graspability requirements of handrails.
3. Handrail extensions are not required at the top and bottom of aisle stairs and aisle ramp runs to permit crossovers within the aisles.

**1028.13.1 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.

**1028.13.2 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.

**1028.14 Assembly guards.** Assembly guards shall comply with Sections 1028.14.1 through 1028.14.3.

**1028.14.1 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.

**1028.14.2 Sightline-constrained guard heights.** Unless subject to the requirements of Section 1028.14.3, 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 required by ICC 300.

**1028.14.3 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.

**1028.15 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 1029 EMERGENCY ESCAPE AND RESCUE**

**1029.1 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 escape 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.

### **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 (18.6 m<sup>2</sup>) in floor area shall not be required to have emergency escape windows.

**1029.2 Minimum size.** Emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet (0.53 m<sup>2</sup>).

**Exception:** The minimum net clear opening for emergency escape and rescue grade-floor openings shall be 5 square feet (0.46 m<sup>2</sup>).

**1029.2.1 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.

**1029.3 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.

**1029.4 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 1029.2 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. Where such bars, grilles, grates or similar devices are installed in existing buildings, smoke alarms shall be installed in accordance with Section 907.2.11 regardless of the valuation of the alteration.

**1029.5 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 1029.5.1 and 1029.5.2.

**1029.5.1 Minimum size.** The minimum horizontal area of the window well shall be 9 square feet (0.84 m<sup>2</sup>), 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.

**1029.5.2 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.

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**4101:1-11-01 Accessibility.**

*[Comment: When a reference is made within this rule to a federal statutory provision, an industry consensus standard, or any other technical publication, the specific date and title of the publication as well as the name and address of the promulgating agency are listed in rule 4101:1-35-01 of the Administrative Code. The application of the referenced standards shall be limited and as prescribed in section 102.5 of rule 4101:1-1-01 of the Administrative Code.]*

**SECTION 1101  
GENERAL**

**1101.1 Scope.** The provisions of this chapter shall control the design and construction of facilities for accessibility for *individuals* with disabilities.

**1101.2 Design.** Buildings and facilities shall be designed and constructed to be accessible in accordance with this code and ICC A117.1 *as amended in section 1112 of this chapter. Any references to ICC A 117.1 throughout this code shall be applied with the amendments indicated in section 1112 of this chapter.*

**SECTION 1102  
DEFINITIONS**

**1102.1 Definitions.** The following *terms* shall, for the purposes of this chapter and as used elsewhere in the code, have the meanings shown herein:

**ACCESSIBLE.** A site, building, facility or portion thereof that complies with this chapter.

**ACCESSIBLE ROUTE.** A continuous, unobstructed path that complies with this chapter.

**ACCESSIBLE UNIT.** A dwelling unit or sleeping unit that complies with this code and the provisions for Accessible units in ICC A117.1.

**AREA OF SPORT ACTIVITY.** *That portion of an indoor or outdoor space, where the play or practice of a sport occurs*

**CIRCULATION PATH.** An exterior or interior way of passage from one place to another for pedestrians.

**COMMON USE.** Interior or exterior circulation paths, rooms, spaces or elements that are not for public use and are made available for the shared use of two or more people.

**DETECTABLE WARNING.** A standardized surface feature built in or applied to walking surfaces or other elements to warn visually impaired persons of hazards on a circulation path.

**DWELLING UNIT OR SLEEPING UNIT, MULTISTORY.** See definition for “Multistory unit.”

**DWELLING UNIT OR SLEEPING UNIT, TYPE A.** See definition for “Type A unit.”

**DWELLING UNIT OR SLEEPING UNIT, TYPE B.** See definition for “Type B unit.”

**EMPLOYEE WORK AREA.** All or any portion of a space used only by employees and only for work. Corridors, toilet rooms, kitchenettes and break rooms are not employee work areas.

**FACILITY.** All or any portion of buildings, structures, site improvements, elements and pedestrian or vehicular routes located on a site.

**INTENDED TO BE OCCUPIED AS A RESIDENCE.** This refers to a dwelling unit or sleeping unit that can or will be used all or part of the time as the occupant’s place of abode.

**MULTILEVEL ASSEMBLY SEATING.** Seating that is arranged in distinct levels where each level is comprised of either multiple rows, or a single row of box seats accessed from a separate level.

**MULTISTORY UNIT.** A dwelling unit or sleeping unit with habitable space located on more than one story.

**PLAY AREA.** *A portion of a site containing play components designed and constructed for children.*

**PUBLIC ENTRANCE.** An entrance that is not a service entrance or a restricted entrance.

**PUBLIC-USE AREAS.** Interior or exterior rooms or spaces that are made available to the general public.

**RESTRICTED ENTRANCE.** An entrance that is made available for common use on a controlled basis, but not public use, and that is not a service entrance.

**SELF-SERVICE STORAGE FACILITY.** Real property designed and used for the purpose of renting or leasing individual storage spaces to customers for the purpose of storing and removing personal property on a self-service basis.

**SERVICE ENTRANCE.** An entrance intended primarily for delivery of goods or services.

**SITE.** A parcel of land bounded by a lot line or a designated portion of a public right-of-way.

**TYPE A UNIT.** A dwelling unit or sleeping unit designed and constructed for accessibility in accordance with this code and the provisions for Type A units in ICC A117.1.

**TYPE B UNIT.** A dwelling unit or sleeping unit designed and constructed for accessibility in accordance with this code and the provisions for Type B units in ICC A117.1, *which complies* with the design and construction requirements of the federal Fair Housing Act.

**WHEELCHAIR SPACE.** A space for a single wheelchair and its occupant.

## **SECTION 1103 SCOPING REQUIREMENTS**

**1103.1 Where required.** Sites, buildings, structures, facilities, elements and spaces, temporary or permanent, shall be accessible to ~~persons~~ individuals with ~~physical~~ disabilities.

**1103.2 General exceptions.** Sites, buildings, structures, facilities, elements and spaces shall be exempt from this chapter to the extent specified in this section.

**1103.2.1 Specific requirements.** Accessibility is not required in buildings and facilities, or portions thereof, to the extent permitted by Sections 1104 through 1110.

**1103.2.2 Existing buildings.** Existing buildings shall comply with Section 3411.

**1103.2.3 Employee work areas.** Spaces and elements within employee work areas shall only be required to comply with Sections 907.9.1.2, 1007 and 1104.3.1 and shall be designed and constructed so that individuals with disabilities can approach, enter and exit the work area. Work areas, or portions of work areas, *other than raised courtroom stations in accordance with Section 1108.4.1.4*, that are less than 300 square feet (30 m<sup>2</sup>) in area and located 7 inches (178 mm) or more above or below the ground or finish floor where the change in elevation is essential to the function of the space shall be exempt from all requirements.

**1103.2.4 Detached dwellings.** Detached one- two-*and three-* family dwellings, ~~and~~ *their* accessory structures, and their associated sites and facilities, are not required to *comply with this chapter*.

**1103.2.5 Utility buildings.** ~~Non-occupiable structures in Group U are exempt from the requirements of this chapter. Group U occupancies are not required to comply with this chapter other than the following:~~

1. In agricultural buildings not used for agricultural purposes as defined in Section 3781.06 of the Revised Code, access is required to paved work areas and areas open to the general public.

Provisions of the federal law, contained within the 2010 “ADA Standards for Accessible Design” may apply to agricultural buildings used for agricultural purposes even though these buildings are outside the scope of this code.

2. Private garages or carports that contain required accessible parking.

**1103.2.6 Construction sites.** Structures, sites and equipment directly associated with the actual processes of construction including, but not limited to, scaffolding, bridging, materials hoists, materials storage or construction trailers are not required to *comply with this chapter*. *Portable toilet units provided for use exclusively by construction personnel on a construction site are not required to be accessible or to be on an accessible route.*

**1103.2.7 Raised areas.** Raised areas used primarily for purposes of security, life safety or fire safety including, but not limited to, observation galleries, prison guard towers, fire towers or lifeguard stands are not required to *comply with this chapter*.

**1103.2.8 Limited access spaces.** Spaces accessed only by ladders, catwalks, crawl spaces, freight elevators or very narrow passageways are not required to *comply with this chapter*.

**1103.2.9 Equipment spaces.** Spaces frequented only by *service* personnel for *occasional* maintenance, repair or monitoring of equipment are not required to *comply with this chapter*. ~~Such spaces include, but are not limited to, elevator pits, elevator penthouses, mechanical, electrical or communications equipment rooms, piping or equipment catwalks, water or sewage treatment pump rooms and stations, electric substations and transformer vaults, and highway and tunnel utility facilities.~~

**1103.2.10 Single-occupant structures.** Single-occupant structures accessed only by passageways below grade or elevated above *standard curb height* including, but not limited to, toll booths that are accessed only by underground tunnels, are not required to be accessible *or to be on an accessible route*.

**1103.2.11 Residential Group R-1.** Buildings of Group R-1 containing not more than five *sleeping units* for rent or hire that are also occupied as the residence of the proprietor are not required to *comply with this chapter*.

**1103.2.12 Day care facilities.** Where a day care facility is part of a *dwelling unit*, only the portion of the structure utilized for the day care facility is required to ~~*comply with this chapter*~~ *be accessible*.

~~**1103.2.13 Live/work units.** In live/work units constructed in accordance with Section 419, the portion of the unit utilized for nonresidential use is required to *comply with this chapter* *be accessible*. The residential portion of the live/work unit is required to be evaluated in accordance with Sections 1107.6.2 and 1107.7.~~

~~**1103.2.14**~~ **1103.2.13 Detention and correctional facilities.** In detention and correctional facilities, *common use* areas that are used only by inmates or detainees and security personnel, and that do not serve holding cells or

housing cells required to be Accessible units, are not required to *comply with this chapter*.

**~~1103.2.15~~ 1103.2.14 Walk-in coolers and freezers.** Walk-in coolers and freezers intended for employee use only are not required to *comply with this chapter*.

**~~1103.2.16~~ 1103.2.15 Areas in places of religious worship.** *Raised or lowered areas, or portions of areas, in places of religious worship that are less than 300 sq.ft. (30 m<sup>2</sup>) in area and located 7 inches or more (178 mm) above or below the finished floor and used primarily for the performance of religious ceremonies are not required to comply with this chapter.*

## SECTION 1104 ACCESSIBLE ROUTE

**1104.1 Site arrival points.** ~~Accessible routes~~ *At least one route* within the site shall be provided from *accessible facilities*; public transportation stops; accessible parking; accessible passenger loading zones; and public streets or sidewalks to the accessible building entrance served.

**Exception:** Other than in buildings or facilities containing or serving Type B units, an accessible route shall not be required between site arrival points and the building or facility entrance if the only means of access between them is a vehicular way not providing for pedestrian access.

**1104.2 Within a site.** At least one accessible route shall connect accessible buildings, accessible facilities, accessible elements and accessible spaces that are on the same site.

**Exceptions:**

1. An accessible route is not required between accessible buildings, accessible facilities, accessible elements and accessible spaces that have, as the only means of access between them, a vehicular way not providing for pedestrian access.
2. *An accessible route to recreational facilities shall only be required to the extent specified in Section 1110.*

**1104.3 Connected spaces.** When a building or portion of a building is required to be accessible, ~~an~~ *at least one* accessible route shall be provided to each portion of the building, to accessible building entrances connecting *accessible pedestrian walkways* and the *public way*.

**Exceptions:**

1. *Stories and mezzanines exempted by Section 1104.4.*

2. In a building, room or space used for assembly purposes with *fixed seating*, an *accessible route* shall not be required to serve levels where *wheelchair spaces* are not provided.
3. *Vertical access to elevated employee work stations within a courtroom is not required at the time of initial construction, provided a ramp, lift or elevator can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.*
4. *An accessible route to recreational facilities shall only be required to the extent specified in Section 1110.*

**1104.3.1 Employee work areas.** Common use circulation paths within employee work areas shall be accessible routes.

**Exceptions:**

1. Common use circulation paths, located within employee work areas that are less than 1,000 square feet (93 m<sup>2</sup>) in size and defined by permanently installed partitions, counters, casework or furnishings, shall not be required to be accessible routes.
2. Common use circulation paths, located within employee work areas, that are an integral component of equipment, shall not be required to be accessible routes.
3. Common use circulation paths, located within exterior employee work areas that are fully exposed to the weather, shall not be required to be accessible routes.

**1104.3.2 Press boxes.** Press boxes *in a building, room or space used for assembly purposes* areas shall be on an accessible route.

**Exceptions:**

1. An accessible route shall not be required to press boxes in bleachers that have ~~points~~ a single point of entry ~~at only one level from the bleachers,~~ provided that the aggregate area of all press boxes for each playing field is not more than 500 square feet (46 m<sup>2</sup>) maximum.
2. An accessible route shall not be required to free-standing press boxes that are ~~elevated above grade~~ more than 12 feet (3660 mm) minimum above grade provided that the aggregate area of all press boxes for each playing field is not more than 500 square feet (46 m<sup>2</sup>) maximum.

**1104.4 Multilevel buildings and facilities.** At least one accessible route shall connect each accessible *story* ~~or~~ and mezzanine, in multilevel buildings and facilities.

**Exceptions:**

1. An accessible route is not required to stories and mezzanines that have an aggregate area of not more than 3,000 square feet (278.7 m<sup>2</sup>) and are located above and below *accessible* levels. This exception shall not apply to:
  - 1.1. Multiple tenant facilities of Group M occupancies containing five or more tenant spaces *used for the sales or rental of goods and where at least one such tenant space is located on a floor level above or below the accessible levels;*
  - 1.2. *Stories or mezzanines* containing offices of health care providers (Group B or I); or
  - 1.3. Passenger transportation facilities and airports (Group A-3 or B).
  - 1.4. Government buildings *and facilities.*
  - 1.5. *Public university, college and school system buildings and facilities.*
2. *Stories or mezzanines* that do not contain accessible elements or other spaces as determined by Section 1107 or 1108 are not required to be served by an accessible route from an accessible level.
3. In air traffic control towers, an accessible route is not required to serve the cab and the floor immediately below the cab.
4. Where a two-story building or facility has one story *or mezzanine* with an occupant load of five or fewer persons that does not contain public use space, that story *or mezzanine* shall not be required to be connected by an accessible route to the story above or below.
5. *Vertical access to elevated employee work stations within a courtroom complying with section 1108.4.1.4.*

**1104.5 Location.** Accessible routes shall coincide with or be located in the same area as a general circulation path. Where the circulation path is interior, the accessible route shall also be interior. Where only one accessible route is provided, the accessible route shall not pass through kitchens, storage rooms, restrooms, closets or similar spaces.

**Exceptions:**

1. Accessible routes from parking garages contained within and serving Type B units are not required to be interior.
2. A single accessible route is permitted to pass through a kitchen or storage room in an Accessible unit, Type A unit or Type B unit.

**1104.6 Security barriers.** Security barriers including, but not limited to, security bollards and security check points shall not obstruct a required accessible route or accessible means of egress.

**Exception:** Where security barriers incorporate elements that cannot comply with these requirements, such as certain metal detectors, fluoroscopes or other similar devices, the accessible route shall be permitted to be provided adjacent to security screening devices. The accessible route shall permit persons with disabilities passing around security barriers to maintain visual contact with their personal items to the same extent provided others passing through the security barrier.

## **SECTION 1105 ACCESSIBLE ENTRANCES**

**1105.1 Public entrances.** In addition to accessible entrances required by Sections 1105.1.1 through 1105.1.6, at least 60 percent of all public entrances shall be accessible.

**Exceptions:**

1. An accessible entrance is not required to areas not required to be accessible.
2. Loading and service entrances that are not the only entrance to a tenant space.

**1105.1.1 Parking garage entrances.** Where provided, direct access for pedestrians from parking structures to buildings or facility entrances shall be accessible.

**1105.1.2 Entrances from tunnels or elevated walkways.** Where direct access is provided for pedestrians from a pedestrian tunnel or elevated walkway to a building or facility, at least one entrance to the building or facility from each tunnel or walkway shall be accessible.

**1105.1.3 Restricted entrances.** Where restricted entrances are provided to a building or facility, at least one restricted entrance to the building or facility shall be accessible.

**1105.1.4 Entrances for inmates or detainees.** Where entrances used only by inmates or detainees and security personnel are provided at judicial facilities, detention facilities or correctional facilities, at least one such entrance shall be accessible.

**1105.1.5 Service entrances.** If a service entrance is the only entrance to a building or a tenant space in a facility, that entrance shall be accessible.

**1105.1.6 Tenant spaces, ~~dwelling units and sleeping units.~~** At least one accessible entrance shall be provided to each tenant, ~~dwelling unit and sleeping unit~~ in a facility.

**Exceptions Exception:**

1. An accessible entrance is not required to ~~tenants~~ self-storage facilities that are not required to be accessible.
2. ~~An accessible entrance is not required to dwelling units and sleeping units that are not required to be Accessible units, Type A units or Type B units.~~

**1105.1.7 Dwelling units and sleeping units.** *At least one accessible entrance shall be provided to each dwelling unit and sleeping unit in a facility.*

**Exception:** *An accessible entrance is not required to dwelling units and sleeping units that are not required to be accessible units, Type A units or Type B units.*

**SECTION 1106  
PARKING AND PASSENGER LOADING FACILITIES**

**1106.1 Required.** Where parking is provided, accessible parking spaces shall be provided in compliance with Table 1106.1, except as required by Sections 1106.2 through 1106.4. Where more than one parking facility is provided on a site, the number of parking spaces required to be accessible shall be calculated separately for each parking facility.

**Exception:** This section does not apply to parking spaces used exclusively for buses, trucks, other delivery vehicles, law enforcement vehicles or vehicular impound and motor pools where lots accessed by the public are provided with an accessible passenger loading zone.

**TABLE 1106.1  
ACCESSIBLE PARKING SPACES**

TOTAL PARKING SPACES PROVIDED	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 1,000	2% of total
1,001 and over	20, plus one for each 100, or fraction thereof, over 1,000

**1106.2 Groups R-2 and R-3.** At least 2 percent, but not less than one, of each type of parking space provided for occupancies in Groups R-2 and R-3, which are required to have Accessible, Type A or Type B dwelling or sleeping units, shall be accessible. Where parking is provided within or beneath a building, accessible parking spaces shall also be provided within or beneath the building.

**1106.3 Hospital outpatient facilities.** At least 10 percent, but not less than one, of care recipient and visitor parking spaces provided to serve hospital outpatient facilities shall be accessible.

**1106.4 Rehabilitation facilities and outpatient physical therapy facilities.** At least 20 percent, but not less than one, of the portion of care recipient and visitor parking spaces serving rehabilitation facilities specializing in treating conditions that affect mobility and outpatient physical therapy facilities shall be accessible.

**1106.5 Van spaces.** For every six or fraction of six accessible parking spaces, at least one shall be a van-accessible parking space.

**Exception:** In Group R-2 and R-3 occupancies, van accessible spaces located within private garages shall be permitted to have vehicular routes, entrances, parking spaces and access aisles with a minimum vertical clearance of 7 feet (2134 mm).

**1106.6 Location.** Accessible parking spaces shall be located on the shortest accessible route of travel from adjacent parking to an accessible building entrance. In parking facilities that do not serve a particular building, accessible parking spaces shall be located on the shortest route to an accessible pedestrian entrance to the parking facility. Where buildings have multiple accessible entrances with adjacent parking, accessible parking spaces shall be dispersed and located near the accessible entrances.

**Exceptions:**

1. In multilevel parking structures, van-accessible parking spaces are permitted on one level.
2. Accessible parking spaces shall be permitted to be located in different parking facilities if substantially equivalent or greater accessibility is provided in terms of distance from an accessible entrance or entrances, parking fee and user convenience.

**1106.7 Passenger loading zones.** Passenger loading zones shall be *accessible*.

**1106.7.1 Continuous loading zones.** Where passenger loading zones are provided, one passenger loading zone in every continuous 100 linear feet (30.4 m) maximum of loading zone space shall be accessible.

**1106.7.2 Medical facilities.** A passenger loading zone shall be provided at an accessible entrance to licensed medical and long-term care facilities where people receive physical or medical treatment or care and where the period of stay exceeds 24 hours.

**1106.7.3 Valet parking.** A passenger loading zone shall be provided at valet parking services.

**1106.7.4 Mechanical access parking garages.** Mechanical access parking garages shall provide at least one passenger loading zone at vehicle drop-off and vehicle pick-up areas.

## **SECTION 1107 DWELLING UNITS AND SLEEPING UNITS**

**1107.1 General.** In addition to the other requirements of this chapter, occupancies having dwelling units or sleeping units shall be provided with accessible features in accordance with this section.

**1107.2 Design.** Dwelling units and sleeping units that are required to be Accessible units, Type A units and Type B units shall comply with the applicable portions of Chapter 10 of ICC A117.1. Units required to be Type A units are permitted to be designed and constructed as Accessible units. Units required to be Type B units are permitted to be designed and constructed as Accessible units or as Type A units.

**1107.3 Accessible spaces.** Rooms and spaces available to the general public or available for use by residents and serving Accessible units, Type A units or Type B units shall be accessible. Accessible spaces shall include toilet and bathing rooms, kitchen, living and dining areas and any exterior spaces, including patios, terraces and balconies.

**Exceptions:**

1. *Stories and mezzanines exempted by Section 1107.4.*
2. Recreational facilities in accordance with Section 1109.15.

3. ~~In Group I-2 hospital facilities, doors to Accessible sleeping units shall not be required to provide the portion of the maneuvering clearance beyond the latch side of the door.~~
- 4.3. *Exterior decks, patios or balconies that are part of Type B units and 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 unit.*

**1107.4 Accessible route.** At least one accessible route shall connect accessible building or facility entrances with the primary entrance of each Accessible unit, Type A unit and Type B unit within the building or facility and with those exterior and interior spaces and facilities that serve the units.

**Exceptions:**

1. If due to circumstances outside the control of the owner, either the slope of the finished ground level between *accessible* facilities and buildings exceeds one unit vertical in 12 units horizontal (1:12), or where physical barriers or legal restrictions prevent the installation of an accessible route, a vehicular route with parking that complies with Section 1106 at each public or common use facility or building is permitted in place of the accessible route.
2. *In Group I-3 facilities, an accessible route is not required to connect stories or mezzanines where Accessible units, all common use areas serving Accessible units and all public use areas are on an accessible route.*
3. *In Group R-2 facilities with Type A units complying with Section 1107.6.2.1.1 an accessible route is not required to connect stories or mezzanines where Type A units, all common use areas serving Type A units and all public use areas are on an accessible route.*
4. *In other than Group R-2 dormitory housing at places of education, in Group R-2 facilities with Accessible units complying with Section 1107.6.2.2.1 an accessible route is not required to connect stories or mezzanines where Accessible units, all common use areas serving Accessible units and all public use areas are on an accessible route.*
5. *In Group R-1 an accessible route is not required to connect stories or mezzanines within individual units, provided the accessible level meets the provisions for Accessible units and sleeping accommodations for two persons minimum, and a toilet facility ~~shall be provide are~~ is provided on that level.*
6. *In Group R-3 and R-4 congregate residences, an accessible route is not required to connect floors or mezzanines where Accessible units or Type B units, all common use areas serving Accessible units and Type B units and all public use areas serving Accessible and Type B units are on an accessible route.*

7. *In Group I-1, I-2, R-1, R-2, R-3 or R-4* a multistory dwelling or sleeping unit which is not provided with elevator service is not required to be a Type A unit or a Type B unit.
8. *In Group I-1, I-2, R-1, R-2, R-3 or R-4* where a multistory unit is provided with external elevator service to only one floor, the floor provided with elevator service shall be the primary entry to the unit, shall comply with the requirements for a Type B unit and a toilet facility shall be provided on that floor.
9. *An accessible route between stories is not required where Type B units are not required by Sections 1107.7.1.1 and 1107.7.1.2.*

**1107.5 Group I.** Accessible units and Type B units shall be provided in Group I occupancies in accordance with Sections 1107.5.1 through 1107.5.5.

**1107.5.1 Group I-1.** Accessible units and Type B units shall be provided in Group I-1 occupancies in accordance with Sections 1107.5.1.1 and 1107.5.1.2.

**1107.5.1.1 Accessible units.** At least 4 percent, but not less than one, of the dwelling units and sleeping units shall be Accessible units. *In Group I-1 assisted living facilities, at least ten percent, but not less than one, of the dwelling units and sleeping units shall be accessible units.*

**1107.5.1.2 Type B units.** In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

**Exception:** The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

**1107.5.2 Group I-2 nursing homes.** Accessible units and Type B units shall be provided in nursing homes of Group I-2 occupancies in accordance with Sections 1107.5.2.1 and 1107.5.2.2.

**1107.5.2.1 Accessible units.** At least 50 percent but not less than one of each type of the dwelling units and sleeping units shall be Accessible units.

**1107.5.2.2 Type B units.** In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit

and sleeping unit intended to be occupied as a residence shall be a Type B unit.

**Exception:** The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

**1107.5.3 Group I-2 hospitals.** Accessible units and Type B units shall be provided in general-purpose hospitals, psychiatric facilities, and detoxification facilities of Group I-2 occupancies in accordance with Sections 1107.5.3.1 and 1107.5.3.2.

**1107.5.3.1 Accessible units.** At least 10 percent, but not less than one, of the dwelling units and sleeping units shall be Accessible units.

**Exception:** Entry doors to accessible dwelling or sleeping units shall not be required to provide the maneuvering clearance beyond the latch side of the door.

**1107.5.3.2 Type B units.** In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

**Exception:** The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

**1107.5.4 Group I-2 rehabilitation facilities.** In hospitals and rehabilitation facilities of Group I-2 occupancies which specialize in treating conditions that affect mobility, or units within either which specialize in treating conditions that affect mobility, 100 percent of the dwelling units and sleeping units shall be Accessible units.

**1107.5.5 Group I-3.** Accessible units shall be provided in Group I-3 occupancies in accordance with Sections 1107.5.5.1 through 1107.5.5.3.

**1107.5.5.1 Group I-3 sleeping units.** In Group I-3 occupancies, at least 2/3 percent of the total number of sleeping units in the facility, but not less than one, ~~of the dwelling units and sleeping units~~ unit in each classification level shall be Accessible units.

**1107.5.5.2 Special holding cells and special housing cells or rooms.** In addition to the Accessible units required by Section 1107.5.5.1, where special holding cells or special housing cells or rooms are provided, at least one serving each purpose shall be an Accessible unit. Cells or rooms

subject to this requirement include, but are not limited to, those used for purposes of orientation, protective custody, administrative or disciplinary detention or segregation, detoxification and medical isolation.

**Exception:** Cells or rooms specially designed without protrusions and that are used solely for purposes of suicide prevention shall not be required to include grab bars.

**1107.5.5.3 Medical care facilities.** Patient sleeping units or cells required to be Accessible units in medical care facilities shall be provided in addition to any medical isolation cells required to comply with Section 1107.5.5.2.

**1107.6 Group R.** Accessible units, Type A units and Type B units shall be provided in Group R occupancies in accordance with Sections 1107.6.1 through 1107.6.4.

**1107.6.1 Group R-1.** Accessible units and Type B units shall be provided in Group R-1 occupancies in accordance with Sections 1107.6.1.1 and 1107.6.1.2.

**1107.6.1.1 Accessible units.** Accessible dwelling units and sleeping units shall be provided in accordance with Table 1107.6.1.1. ~~At~~ Where buildings contain more than 50 dwelling or sleeping units, the number of accessible units shall be determined per building. Where buildings contain 50 or fewer dwelling or sleeping units, all dwelling units and sleeping units on a site shall be considered to determine the total number of Accessible units. Accessible units shall be dispersed among the various classes of units. ~~Roll-in showers provided in Accessible units shall include a permanently mounted folding shower seat.~~

**TABLE 1107.6.1.1  
ACCESSIBLE DWELLING UNITS AND SLEEPING UNITS**

<b>TOTAL NUMBER OF UNITS PROVIDED</b>	<b>MINIMUM REQUIRED NUMBER OF ACCESSIBLE UNITS WITHOUT ROLL-IN SHOWERS</b>	<b>MINIMUM REQUIRED NUMBER OF ACCESSIBLE UNITS WITH ROLL-IN SHOWERS</b>	<b>TOTAL NUMBER OF REQUIRED ACCESSIBLE UNITS</b>
1 to 25	1	0	1
26 to 50	2	0	2
51 to 75	3	1	4

76 to 100	4	1	5
101 to 150	5	2	7
151 to 200	6	2	8
201 to 300	7	3	10
301 to 400	8	4	12
401 to 500	9	4	13
501 to 1,000	2% of total	1% of total 3	% of total
Over 1,000	20, plus 1 for each 100, or fraction thereof, over 1,000	10 plus 1 for each 100, or fraction thereof, over 1,000	30 plus 2 for each 100, or fraction thereof, over 1,000

~~**1107.6.1.1.1 Accessible unit facilities.** All interior and exterior spaces provided as part of or serving an Accessible dwelling unit or sleeping unit shall be accessible and be located on an accessible route.~~

~~**Exceptions:**~~

- ~~1. Where multiple bathrooms are provided within an Accessible unit, at least one full bathroom shall be accessible.~~
- ~~2. Where multiple family or assisted bathrooms serve an Accessible unit at least 50 percent but not less than one room for each use at each cluster shall be accessible.~~
- ~~3. Five percent, but not less than one bed shall be accessible.~~

**1107.6.1.2 Type B units.** In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

**Exception:** The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

**1107.6.2 Group R-2.** Accessible units, Type A units and Type B units shall be provided in Group R-2 occupancies in accordance with Sections 1107.6.2.1 and 1107.6.2.2.

**1107.6.2.1 Live/work units.** In live/work units constructed in accordance with Section 419, the nonresidential portion of the unit utilized for nonresidential use is required to be accessible. In a structure, where there are four or more live/work units intended to be occupied as a residence, the residential portion of the live/work unit is required to be evaluated separately in accordance with Sections 1107.6.2 and 1107.7 shall be a Type B unit.

**Exception:** The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

**~~1107.6.2.1~~ 1107.6.2.2 Apartment houses, monasteries and convents.**

Type A units and Type B units shall be provided in apartment houses, monasteries and convents in accordance with Sections ~~1107.6.2.1.1~~ and ~~1107.6.2.1.2~~.

**~~1107.6.2.1.1~~ 1107.6.2.2.1 Type A units.** In Group R-2 occupancies containing more than 20 dwelling units or sleeping units, at least 2 percent but not less than one of the units shall be a Type A unit. All Group R-2 units on a site shall be considered to determine the total number of units and the required number of Type A units. Type A units shall be dispersed among the various classes of units.

**Exceptions:**

1. The number of Type A units is permitted to be reduced in accordance with Section 1107.7.
2. Existing structures on a site shall not contribute to the total number of units on a site.

**~~1107.6.2.1.2~~ 1107.6.2.2.2 Type B units.** Where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

**Exception:** The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

**~~1107.6.2.2~~ 1107.6.2.3 Group R-2 other than live/work units, apartment houses, monasteries and convents.** In Group R-2 occupancies, other than live/work units, apartment houses, monasteries and convents not falling within the scope of Section 1107.6.2.1 and 1107.6.2.2, Accessible units and Type B units shall be provided in accordance with Sections ~~1107.6.2.2.1~~ 1107.6.2.3.1 and ~~1107.6.2.2.2~~ 1107.6.2.3.2.

**~~1107.6.2.2.1~~ 1107.6.2.3.1 Accessible units.** Accessible dwelling units and sleeping units shall be provided in accordance with Table 1107.6.1.1.

**~~1107.6.2.2.2~~ 1107.6.2.3.2 Type B units.** Where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling unit and every sleeping unit intended to be occupied as a residence shall be a Type B unit.

**Exception:** The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

**1107.6.3 Group R-3.** In Group R-3 occupancies where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

**Exception:** The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

**1107.6.4 Group R-4.** Accessible units and Type B units shall be provided in Group R-4 occupancies in accordance with Sections 1107.6.4.1 and 1107.6.4.2.

**1107.6.4.1 Accessible units.** At In Group R-4, other than assisted living facilities, at least one of the dwelling or sleeping units shall be an Accessible unit. In Group R-4 assisted living facilities, at least two of the dwelling or sleeping units shall be an accessible unit.

**1107.6.4.2 Type B units.** In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

**Exception:** The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

**1107.7 General exceptions.** Where specifically permitted by Section 1107.5 or 1107.6, the required number of Type A units and Type B units is permitted to be reduced in accordance with Sections 1107.7.1 through 1107.7.4.

**1107.7.1 Structures without elevator service.** Where no elevator service is provided in a structure, only the dwelling units and sleeping units that are located on stories indicated in Sections 1107.7.1.1 and 1107.7.1.2 are required to be Type A units and Type B units, respectively. The number of Type A units shall be determined in accordance with Section 1107.6.2.1.1.

**1107.7.1.1 One story with Type B units required.** At least one story containing dwelling units or sleeping units intended to be occupied as a residence shall be provided with an accessible entrance from the exterior of the structure and all units intended to be occupied as a residence on that story shall be Type B units.

**1107.7.1.2 Additional stories with Type B units.** On all other stories that have a building entrance in proximity to arrival points intended to serve units on that story, as indicated in Items 1 and 2, all dwelling units and sleeping units intended to be occupied as a residence served by that entrance on that story shall be Type B units.

1. Where the slopes of the undisturbed site measured between the planned entrance and all vehicular or pedestrian arrival points within 50 feet (15 240 mm) of the planned entrance are 10 percent or less, and
2. Where the slopes of the planned finished grade measured between the entrance and all vehicular or pedestrian arrival points within 50 feet (15 240 mm) of the planned entrance are 10 percent or less.

Where no such arrival points are within 50 feet (15 240 mm) of the entrance, the closest arrival point shall be used unless that arrival point serves the story required by Section 1107.7.1.1.

**1107.7.2 Elevator service to the lowest story with units.** Where elevator service in the building provides an accessible route only to the lowest story containing dwelling or sleeping units intended to be occupied as a residence, only the units on that story which are intended to be occupied as a residence are required to be Type B units.

**1107.7.3 Site impracticality.** On a site with multiple non-elevator buildings, the number of units required by Section 1107.7.1 to be Type B units is permitted to be reduced to a percentage which is equal to the percentage of the entire site having grades, prior to development, which are less than 10 percent, provided that all of the following conditions are met:

1. Not less than 20 percent of the units required by Section 1107.7.1 on the site are Type B units;
2. Units required by Section 1107.7.1, where the slope between the building entrance serving the units on that story and a pedestrian or vehicular arrival point is no greater than 8.33 percent, are Type B units;
3. Units required by Section 1107.7.1, where an elevated walkway is planned between a building entrance serving the units on that story and a pedestrian or vehicular arrival point and the slope between them is 10 percent or less are Type B units; and
4. Units served by an elevator in accordance with Section 1107.7.2 are Type B units.

**1107.7.4 Design flood elevation.** The required number of Type A units and Type B units shall not apply to a site where the required elevation of the lowest floor or the lowest horizontal structural building members of non-elevator buildings are at or above the design flood elevation resulting in:

1. A difference in elevation between the minimum required floor elevation at the primary entrances and vehicular and pedestrian arrival points within 50 feet (15 240 mm) exceeding 30 inches (762 mm), and
2. A slope exceeding 10 percent between the minimum required floor elevation at the primary entrances and vehicular and pedestrian arrival points within 50 feet (15 24 m).

Where no such arrival points are within 50 feet (15 24 mm) of the primary entrances, the closest arrival points shall be used.

## **SECTION 1108 SPECIAL OCCUPANCIES**

**1108.1 General.** In addition to the other requirements of this chapter, the requirements of Sections 1108.2 through 1108.4 shall apply to specific occupancies.

**1108.2 Assembly area seating.** *A building, room or space used for assembly purposes with fixed seating shall comply with Sections 1108.2.1 through 1108.2.5. Lawn seating shall comply with Section 1108.2.6. Assistive listening systems shall comply with Section 1108.2.7. Performance areas viewed from assembly seating areas shall comply with Section 1108.2.8. Dining areas shall comply with Section 1108.2.9.*

**1108.2.1 Services.** If a service or facility is provided in an area that is not accessible, the same service or facility shall be provided on an accessible level and shall be accessible.

**1108.2.2 Wheelchair spaces.** In theaters, bleachers, grandstands, stadiums, arenas and other fixed seating assembly areas, accessible wheelchair spaces shall be provided in accordance with Sections 1108.2.2.1 through 1108.2.2.4.

**1108.2.2.1 General seating.** Wheelchair spaces shall be provided in accordance with Table 1108.2.2.1.

**TABLE 1108.2.2.1**

**ACCESSIBLE WHEELCHAIR SPACES**

CAPACITY OF SEATING IN ASSEMBLY AREAS	MINIMUM REQUIRED NUMBER OF WHEELCHAIR SPACES
4 to 25	1
26 to 50	2
51 to 100	4
101 to 300	5
301 to 500	6
501 to 5,000	6, plus 1 for each 150, or fraction thereof, between 501 through 5,000
5,001 and over	36 plus 1 for each 200, or fraction thereof, over 5,000

**1108.2.2.2 Luxury boxes, club boxes and suites.** In each luxury box, club box, and suite within arenas, stadiums and grandstands, wheelchair spaces shall be provided in accordance with Table 1108.2.2.1.

**1108.2.2.3 Other boxes.** In boxes other than those required to comply with Section 1108.2.2.2, the total number of wheelchair spaces provided shall be determined in accordance with Table 1108.2.2.1. Wheelchair spaces shall be located in not less than 20 percent of all boxes provided.

**1108.2.2.4 Team or player seating.** At least one wheelchair space shall be provided in team or player seating areas serving areas of sport activity.

**Exception:** Wheelchair spaces shall not be required in team or player seating areas serving bowling lanes that are not required to be located on an accessible route in accordance with Section *1109.15.4.1*.

**1108.2.3 Companion seats.** At least one companion seat shall be provided for each wheelchair space required by Sections 1108.2.2.1 through 1108.2.2.3.

**1108.2.4 Dispersion of wheelchair spaces in multilevel assembly seating areas.** In multilevel assembly seating areas, wheelchair spaces shall be provided on the main floor level and on *at least* one of each two additional floor or mezzanine levels. Wheelchair spaces shall be provided in each luxury box, club box and suite within assembly facilities. *In addition, wheelchair spaces shall be located in each balcony or mezzanine that is located on an accessible route.*

**Exceptions:**

1. In multilevel assembly seating areas utilized for worship services where the second floor or mezzanine level contains 25 percent or less of the total seating capacity, wheelchair spaces shall be permitted to all be located on the main level.

2. In multilevel assembly seating areas where the second floor or mezzanine level provides 25 percent or less of the total seating capacity, all wheelchair spaces shall be permitted to be located on the main level.
3. Wheelchair spaces in team or player seating serving areas of sport activity are not required to be dispersed.

**1108.2.5 Designated aisle seats.** At least 5 percent, but not less than one, of the total number of aisle seats provided shall be designated aisle seats and shall be the aisle seats located closest to accessible routes.

**Exception:** Designated aisle seats are not required in team or player seating serving areas of sport activity.

**1108.2.6 Lawn seating.** Lawn seating areas and exterior overflow seating areas, where fixed seats are not provided, shall connect to an accessible route.

**1108.2.7 Assistive listening systems.** Each *building, room or space used for assembly purposes* where audible communications are integral to the use of the space shall have an assistive listening system.

**Exception:** Other than in courtrooms, an assistive listening system is not required where there is no audio amplification system.

**1108.2.7.1 Receivers.** ~~Receivers~~ the number and type of receivers shall be provided for assistive listening systems in accordance with Table 1108.2.7.1.

**Exceptions:**

1. Where a building contains more than one *room or space used for assembly purposes*, the total number of required receivers shall be permitted to be calculated according to the total number of seats in the building, provided that all receivers are usable with all systems and if *the rooms or spaces used for assembly purposes* required to provide assistive listening are under one management.
2. Where all seats in a *building, room or space used for assembly purposes* are served by an induction loop assistive listening system, the minimum number of receivers required by Table 1108.2.7.1 to be hearing-aid compatible shall not be required.

**TABLE 1108.2.7.1  
RECEIVERS FOR ASSISTIVE LISTENING SYSTEMS**

CAPACITY OF SEATING IN ASSEMBLY AREAS	MINIMUM REQUIRED NUMBER OF RECEIVERS	MINIMUM NUMBER OF RECEIVERS TO BE
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		<b>HEARING-AID COMPATIBLE</b>
50 or less	2	2
51 to 200	2, plus 1 per 25 seats over 50 seats*	2
201 to 500	2, plus 1 per 25 seats over 50 seats*	1 per 4 receivers*
501 to 1,000	20, plus 1 per 33 seats over 500 seats*	1 per 4 receivers*
1,001 to 2,000	35, plus 1 per 50 seats over 1,000 seats*	1 per 4 receivers*
Over 2,000	55, plus 1 per 100 seats over 2,000 seats*	1 per 4 receivers*

NOTE: \* = or fraction thereof

**1108.2.7.2 Ticket Windows.** Where ticket windows are provided in stadiums and arenas at least one window at each location shall have an assistive listening system.

**1108.2.7.3 Public address systems.** Where stadiums, arenas and grandstands have 15,000 fixed seats or more and provide audible public announcements, they shall also provide *pre-recorded or real-time captions of those audible public announcements.*

**1108.2.8 Performance areas.** An accessible route shall directly connect the performance area to the assembly seating area where a circulation path directly connects a performance area to an assembly seating area. An accessible route shall be provided from performance areas to ancillary areas or facilities used by performers.

**1108.2.9 Dining and drinking areas.** In dining and drinking areas, all interior and exterior floor areas shall be accessible *and be on an accessible route.*

**Exceptions:**

1. An accessible route between accessible levels and stories above or below is not required where permitted by Section 1104.4, Exception 1.
2. An accessible route to *dining and drinking areas* in a mezzanine is not required, provided that the mezzanine contains less than 25 percent of the total combined area for *dining and drinking* and the same services and decor are provided in the accessible area.
3. In sports facilities, tiered dining areas providing seating required to be *accessible* shall be required to have accessible routes serving at least 25 percent of the dining area, provided that accessible routes serve

*accessible* seating and where each tier is provided with the same services.

4. Employee only work areas shall comply with Sections 1103.2.3 and 1104.3.1.

**1108.2.9.1 Dining surfaces.** Where dining surfaces for the consumption of food or drink are provided, at least 5 percent, but not less than one, of the dining surfaces for the seating and standing spaces shall be accessible and be distributed throughout the facility and located on a level accessed by an accessible route.

**1108.3 Self-service storage facilities.** Self-service storage facilities shall provide accessible individual self-storage spaces in accordance with Table 1108.3.

**TABLE 1108.3  
ACCESSIBLE SELF-SERVICE STORAGE FACILITIES**

<b>TOTAL SPACES IN FACILITY</b>	<b>MINIMUM NUMBER OF REQUIRED ACCESSIBLE SPACES</b>
1 to 200	5%, but not less than 1
Over 200	10, plus 2% of total number of units over 200

**1108.3.1 Dispersion.** Accessible individual self-service storage spaces shall be dispersed throughout the various classes of spaces provided. Where more classes of spaces are provided than the number of required accessible spaces, the number of accessible spaces shall not be required to exceed that required by Table 1108.3. Accessible spaces are permitted to be dispersed in a single building of a multi-building facility.

**1108.4 Judicial facilities.** Judicial facilities shall comply with Sections 1108.4.1 through 1108.4.3.

**1108.4.1 Courtrooms.** Each courtroom shall be accessible and comply with Sections 1108.4.1.1 through 1108.4.1.5.

**1108.4.1.1 Jury box.** A wheelchair space shall be provided within the jury box.

**Exception:** Adjacent companion seating is not required.

**1108.4.1.2 Gallery seating.** Wheelchair spaces shall be provided in accordance with Table 1108.2.2.1. Designated aisle seats shall be provided in accordance with Section 1108.2.5.

**1108.4.1.3 Assistive listening systems.** An assistive listening system must be provided. Receivers shall be provided for the assistive listening system in accordance with Section 1108.2.7.1.

**1108.4.1.4 Employee work stations.** The judge's bench, clerk's station, bailiff's station, deputy clerk's station and court reporter's station shall be located on an accessible route. The vertical access to elevated employee work stations within a courtroom is not required at the time of initial construction, provided a ramp, lift or elevator can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.

**1108.4.1.5 Other work stations.** The litigant's and counsel stations, including the lectern, shall be accessible.

**1108.4.2 Holding cells.** Central holding cells and court-floor holding cells shall comply with Sections 1108.4.2.1 and 1108.4.2.2.

**1108.4.2.1 Central holding cells.** Where separate central holding cells are provided for adult males, juvenile males, adult females or juvenile females, one of each type shall be accessible. Where central holding cells are provided and are not separated by age or sex, at least one accessible cell shall be provided.

**1108.4.2.2 Court-floor holding cells.** Where separate court-floor holding cells are provided for adult males, juvenile males, adult females or juvenile females, each courtroom shall be served by one accessible cell of each type. Where court-floor holding cells are provided and are not separated by age or sex, courtrooms shall be served by at least one accessible cell. Accessible cells shall be permitted to serve more than one courtroom.

**1108.4.3 Visiting areas.** Visiting areas shall comply with Sections 1108.4.3.1 and 1108.4.3.2.

**1108.4.3.1 Cubicles and counters.** At least 5 percent but no fewer than one of the cubicles shall be accessible on both the visitor and detainee sides. Where counters are provided, at least one shall be accessible on both the visitor and detainee sides.

**Exception:** This requirement shall not apply to the detainee side of cubicles or counters at noncontact visiting areas not serving Accessible unit holding cells.

**1108.4.3.2 Partitions.** Where solid partitions or security glazing separate visitors from detainees, at least one of each type of cubicle or counter partition shall be accessible.

## SECTION 1109 OTHER FEATURES AND FACILITIES

**1109.1 General.** Accessible building features and facilities shall be provided in accordance with Sections 1109.2 through *1109.15*.

**Exception:** *Accessible units*, Type A units and Type B units shall comply with Chapter 10 of ICC A117.1.

**1109.2 Toilet and bathing facilities.** Each toilet room and bathing room shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. ~~At~~ Except as provided for in Sections 1109.2.2 and 1109.2.3, at least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible.

**Exceptions:**

1. ~~In toilet *Toilet* rooms or bathing rooms accessed only through a private office, not for common or public use and intended for use by a single occupant, shall be permitted to comply with the specific exceptions in ICC A117.1 any of the following alternatives are allowed:~~
  - ~~1.1. Doors are permitted to swing into the clear floor space, provided the door swing can be reversed to meet the requirements in ICC A117.1;~~
  - ~~1.2. The height requirements for the water closet in ICC A117.1 are not applicable;~~
  - ~~1.3. Grab bars are not required to be installed in a toilet room, provided that reinforcement has been installed in the walls and located so as to permit the installation of such grab bars; and~~
  - ~~1.4. The requirement for height, knee and toe clearance shall not apply to a lavatory.~~
2. This section is not applicable to toilet and bathing rooms that serve dwelling units or sleeping units that are not required to be accessible by Section 1107.

3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible.
4. Where no more than one urinal is provided in a toilet room or bathing room, the urinal is not required to be accessible.
5. Toilet rooms *or bathing rooms* that are part of critical care or intensive care patient sleeping rooms *servicing accessible units* are not required to be accessible.
6. *Toilet rooms or bathing rooms designed for a bariatric patient are not required to comply with the toilet room and bathing room requirement in ICC A117.1. The sleeping units served by bariatric toilet or bathing rooms shall not count toward the required number of accessible sleeping units.*
- 6.7. *Where toilet facilities are primarily for children's use, required accessible water closets, toilet compartments and lavatories shall be permitted to comply with children's provision of ICC A117.1.*

**1109.2.1 Family or assisted-use toilet and bathing rooms.** In assembly and mercantile occupancies, an accessible family or assisted-use toilet room shall be provided where an aggregate of six or more male and female water closets is required. In buildings of mixed occupancy, only those water closets required for the assembly or mercantile occupancy shall be used to determine the family or assisted-use toilet room requirement. In recreational facilities where separate-sex bathing rooms are provided, an accessible family or assisted-use bathing room shall be provided. Fixtures located within family or assisted-use toilet and bathing rooms shall be included in determining the number of fixtures provided in an occupancy.

**Exception:** Where each separate-sex bathing room has only one shower or bathtub fixture, a family or assisted-use bathing room is not required.

**1109.2.1.1 Standard.** Family or assisted-use toilet and bathing rooms shall comply with Sections 1109.2.1.2 through 1109.2.1.7.

**1109.2.1.2 Family or assisted-use toilet rooms.** Family or assisted-use toilet rooms shall include only one water closet and only one lavatory. A family or assisted-use bathing room in accordance with Section 1109.2.1.3 shall be considered a family or assisted-use toilet room.

**Exception:** A urinal is permitted to be provided in addition to the water closet in a family or assisted-use toilet room.

**1109.2.1.3 Family or assisted-use bathing rooms.** Family or assisted-use bathing rooms shall include only one shower or bathtub fixture. Family or assisted-use bathing rooms shall also include one water closet and one lavatory. Where storage facilities are provided for separate-sex bathing rooms, accessible storage facilities shall be provided for family or assisted-use bathing rooms.

**1109.2.1.4 Location.** Family or assisted-use toilet and bathing rooms shall be located on an accessible route. Family or assisted-use toilet rooms shall be located not more than one story above or below separate-sex toilet rooms. The accessible route from any separate-sex toilet room to a family or assisted-use toilet room shall not exceed 500 feet (152 m).

**1109.2.1.5 Prohibited location.** In passenger transportation facilities and airports, the accessible route from separate-sex toilet rooms to a family or assisted-use toilet room shall not pass through security checkpoints.

**1109.2.1.6 Clear floor space.** Where doors swing into a family or assisted-use toilet or bathing room, a clear floor space not less than 30 inches by 48 inches (762 mm by 1219 mm) shall be provided, within the room, beyond the area of the door swing.

**1109.2.1.7 Privacy.** Doors to family or assisted-use toilet and bathing rooms shall be securable from within the room.

**1109.2.2 Water closet compartment.** Where water closet compartments are provided in a toilet room or bathing room, at least ~~one~~ five percent of the total number of compartments shall be wheelchair-accessible ~~compartment shall be provided~~ compartments. Where the combined total water closet compartments and urinals provided in a toilet room or bathing room is six or more, at least ~~one~~ five percent of the total number of compartments shall be ambulatory-accessible water closet compartment shall be provided in addition to the wheelchair-accessible compartment.

**1109.2.3 Lavatories.** Where lavatories are provided, at least 5 percent, but not less than one, shall be accessible. Where an accessible lavatory is located within the accessible water closet compartment, that lavatory shall not be the only accessible lavatory in the multi-compartment toilet room. Where the total lavatories provided in a toilet room or bathing facility is six or more, at least one lavatory with enhanced reach ranges, shall be provided.

**1109.3 Sinks.** Where sinks are provided, at least 5 percent but not less than one provided in accessible spaces shall *be accessible*:

**Exception:** Mop or service sinks are not required to be accessible or be on an accessible route.

**1109.4 Kitchens and kitchenettes.** Where kitchens and kitchenettes are provided in accessible spaces or rooms, they shall be accessible and be on an accessible route.

**1109.5 Drinking fountains.** Where drinking fountains are provided on an exterior site, on a floor, or within a secured area, the drinking fountains shall be provided in accordance with Sections 1109.5.1 and 1109.5.2.

**1109.5.1 Minimum number.** *No fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.*

**Exceptions:**

1. A single drinking fountain *with two separate spouts* that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.
2. *Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor.*

**1109.5.2 More than the minimum number.** Where more than the minimum number of drinking fountains specified in Section 1109.5.1 are provided, 50 percent of the total number of drinking fountains provided shall comply with the requirements for persons who use a wheelchair and 50 percent of the total number of drinking fountains provided shall comply with the requirements for standing persons.

**Exceptions:**

1. Where 50 percent of the drinking fountains yields a fraction, 50 percent shall be permitted to be rounded up or down, provided that the total number of drinking fountains complying with this section equals 100 percent of the drinking fountains.
2. *Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply*

*with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor.*

**1109.6 Saunas and Steam Rooms.** *Where provided, saunas and steam rooms shall be accessible.*

**Exception:** *Where saunas or steam rooms are clustered at a single location, at least 5 percent of the saunas and steam rooms, but not less than one, of each type in each cluster shall be accessible.*

**1109.7 Elevators.** *Passenger elevators on an accessible route shall be accessible and comply with Chapter 30.*

**1109.8 Lifts.** *Platform (wheelchair) lifts are permitted to be a part of a required accessible route in new construction where indicated in Items 1 through 12. Platform (wheelchair) lifts shall be installed in accordance with ASME A18.1.*

1. *An accessible route to performing areas and speaker platforms.*
2. *An accessible route to wheelchair spaces required to comply with the wheelchair space dispersion requirements of Sections 1108.2.2 through 1108.2.6.*
3. *An accessible route to spaces that are not open to the general public with an occupant load of not more than five.*
4. *An accessible route to or within an individual dwelling or sleeping unit required to be an Accessible unit, Type A unit or Type B unit.*
- ~~5. *An accessible route to wheelchair seating spaces located in sports facilities with dining terraces required to comply with the wheelchair dispersion requirements of Section 1108.2.9, Exception 3.*~~
- ~~6.~~5. *An accessible route to jury boxes and witness stands; raised courtroom stations including judges' benches, clerks' stations, bailiffs' stations, deputy clerks' stations and court reporters' stations; and to depressed areas such as the well of the court.*
- ~~7.~~6. *An accessible route to load and unload areas serving amusement rides.*
- ~~8.~~7. *An accessible route to play components or soft contained play structures.*
- ~~9.~~8. *An accessible route to team or player seating areas serving areas of sport activity.*
- ~~10.~~9. *An accessible route instead of gangways serving recreational boating facilities and fishing piers and platforms.*
- ~~11.~~10. *An accessible route where existing exterior site constraints make use of a ramp or elevator infeasible.*
- ~~12.~~11. *An accessible route to raised platforms in places of religious worship.*

**1109.9 Storage.** Where fixed or built-in storage elements such as cabinets, coat hooks, shelves, medicine cabinets, lockers, closets and drawers are provided in required accessible spaces, at least *five percent, but not less than one of each type shall be accessible.*

**1109.9.1 Equity.** *Accessible facilities and spaces shall be provided with the same storage elements as provided in the similar non-accessible facilities and spaces.*

**1109.9.2 Shelving and display units.** Self-service shelves and display units shall be located on an accessible route. Such shelving and display units shall not be required to comply with reach-range provisions.

~~**1109.10 Detectable warnings.** Passenger transit platform edges bordering a drop-off and not protected by platform screens or guards shall have a detectable warning.~~

~~**Exception:** Detectable warnings are not required at bus stops.~~

**Mail receptacles.** *Where provided, mail receptacles shall be accessible in accordance with Sections 1109.10.1 or 1109.10.2.*

**1109.10.1 Dwelling units and sleeping units.** *Where mail receptacles are provided for Accessible, Type A or Type B dwelling and sleeping units, accessible mail receptacles shall be provided in accordance with 1109.10.1.1 or 1109.10.1.2.*

**1109.10.1.1 Centralized mail receptacles.** *Where each individual mail compartment of a centralized mail receptacle is assigned to a specific dwelling unit or sleeping unit, the individual mail compartments shall comply with 1109.10.1.1.1 or 1109.10.1.1.2.*

**1109.10.1.1.1 Buildings without an elevator.** *In a structure without an elevator, all individual mail compartments assigned to Accessible Units, Type A Units and Type B Units in each location shall be accessible.*

**1109.10.1.1.2 Buildings with an elevator.** *In a structure with an elevator, fifty percent of all individual mail compartments in each location shall be accessible. Individual mail compartments assigned to Accessible and Type A units shall be included in the accessible mailboxes. In addition to the individual mail*

compartments assigned to dwelling or sleeping units, an additional number of individual mail compartments that is equal to ten percent of the total number of dwelling units and sleeping units, but not less than one, at each location shall be accessible.

**1109.10.1.1.3 Parcel lockers.** All parcel lockers of centralized mail receptacles shall be accessible.

**1109.10.1.2 Individual house-mounted and curbside mail receptacles.** Where an individual house-mounted or curbside mail receptacle serves a dwelling unit or sleeping unit that is required to be an Accessible unit, Type A unit or Type B unit, the mail receptacle shall be accessible.

**1109.10.2 Other occupancies.** Where mail receptacles are provided in occupancies not falling within the purview of Section 1109.10.1, at least 5 percent, but not less than one, of each type in each location, shall be accessible.

**1109.11 Seating at tables, counters and work surfaces.** Where seating or standing space at fixed or built-in tables, counters or work surfaces is provided in accessible spaces, at least 5 percent of the seating and standing spaces, but not less than one, shall be accessible. ~~In Group I-3 occupancy visiting areas at least 5 percent, but not less than one, cubicle or counter shall be accessible on both the visitor and detainee sides.~~

**Exceptions Exception:**

1. Check-writing surfaces at check-out aisles not required to comply with Section 1109.11.2 are not required to be accessible.
2. ~~In Group I-3 occupancies, the counter or cubicle on the detainee side is not required to be accessible at noncontact visiting areas or in areas not serving accessible holding cells or sleeping units.~~

**1109.11.1 Dispersion.** Accessible fixed or built-in seating at tables, counters or work surfaces shall be distributed throughout the space or facility containing such elements and located on a level accessed by an accessible route.

**1109.12 Service facilities.** Service facilities shall provide for accessible features in accordance with Sections 1109.12.1 through 1109.12.5.

**1109.12.1 Dressing, fitting and locker rooms.** Where dressing rooms, fitting rooms or locker rooms are provided, at least 5 percent, but not less than one, of each type of use in each cluster provided shall be accessible.

**1109.12.2 Check-out aisles.** Where check-out aisles are provided, accessible check-out aisles shall be provided in accordance with Table 1109.12.2. Where check-out aisles serve different functions, ~~at least one accessible check-out aisle shall be provided for each function.~~ Where check-out aisles serve different functions, accessible check-out aisles shall be provided in accordance with Table 1109.12.2 for each function. Where check-out aisles are dispersed throughout the building or facility, accessible check-out aisles shall also be dispersed. Traffic control devices, security devices and turnstiles located in accessible check-out aisles or lanes shall be accessible.

**Exception:** Where the public use area is under 5000 square feet (465 m<sup>2</sup>) no more than one accessible check-out aisle shall be required.

**TABLE 1109.12.2  
ACCESSIBLE CHECK-OUT AISLES**

<b>TOTAL CHECK-OUT AISLES OF EACH FUNCTION</b>	<b>MINIMUM NUMBER OF ACCESSIBLE CHECK-OUT AISLES OF EACH FUNCTION</b>
1 to 4	1
5 to 8	2
9 to 15	3
Over 15	3, plus 20% of additional aisles

**1109.12.3 Point of sale and service counters.** Where counters are provided for sales or distribution of goods or services, at least one of each type provided shall be accessible. Where such counters are dispersed throughout the building or facility, accessible counters shall also be dispersed.

**1109.12.4 Food service lines.** Food service lines shall be accessible. Where self-service shelves are provided, at least 50 percent, but not less than one, of each type provided shall be accessible.

**1109.12.5 Queue and waiting lines.** Queue and waiting lines servicing accessible counters or check-out aisles shall be accessible.

**1109.13 Controls, operating mechanisms and hardware.** Controls, operating mechanisms and hardware intended for operation by the occupant, including switches that control lighting and ventilation and electrical convenience outlets, in

accessible spaces, along accessible routes or as parts of accessible elements shall be accessible.

**Exceptions:**

1. Operable parts that are intended for use only by service or maintenance personnel shall not be required to be accessible.
2. Electrical or communication receptacles serving a dedicated use shall not be required to be accessible.
3. Where two or more outlets are provided in a kitchen above a length of counter top that is uninterrupted by a sink or appliance, one outlet shall not be required to be accessible.
4. Floor electrical receptacles shall not be required to be accessible.
5. HVAC diffusers shall not be required to be accessible.
6. Except for light switches, where redundant controls are provided for a single element, one control in each space shall not be required to be accessible.
7. Access doors or gates in barrier walls and fences protecting pools, spas and hot tubs shall be permitted to ~~have operable parts of the release of latch on self latching devices at 54 inches (1370 mm) maximum and 48 inches minimum above the finished floor or ground, provided the self-latching devices are not also self-locking devices, operated by means of a key, electronic opener, or integral combination lock~~ comply with 1008.1.9.2.

**1109.13.1 Operable window.** Where operable windows are provided in rooms that are required to be accessible in accordance with Sections 1107.5.1.1, 1107.5.2.1, 1107.5.3.1, 1107.5.4, 1107.6.1.1, 1107.6.2.1.1, 1107.6.2.2.1 and 1107.6.4.1, at least one window in each room shall be accessible and each required operable window shall be accessible.

**Exception:** Accessible windows are not required in bathrooms and kitchens.

**1109.14 Fuel-dispensing systems.** Fuel-dispensing systems shall be accessible.

**1109.15 Gaming machines and gaming tables.** *Where provided, two percent, but not less than one of each type of gaming tables provided shall be accessible and provided with a front approach. Where provided, two percent of gaming machines provided shall be accessible and provided with a front approach. Accessible gaming machines shall be distributed throughout the different types of gaming machines provided.*

**1109.16 Detectable warnings.** Passenger transit platform edges bordering a drop-off and not protected by platform screens or guards shall have a detectable warning.

**Exception:** Detectable warnings are not required at bus stops.

## SECTION 1110 RECREATIONAL FACILITIES

**1110.1 General.** Recreational facilities shall be provided with accessible features to the extent indicated in Sections 1110.2 through 1110.4 in accordance with the recreational facility provisions in ICC A117.1.

~~**1110.2 Facilities serving other than Group R-2, R-3 and R-4 occupancies.** Unless serving R-2, R-3 or R-4 occupancies as provided for in Section 1110.3, recreational facilities shall be accessible in accordance with Section 1110.4.~~

~~**1110.3 Facilities serving Group R-2, R-3 and R-4 occupancies.** Recreational facilities that are provided serving serve Group R-2, R-3 and Group R-4 shall comply with Section ~~1110.3.1~~ 1110.2.1 through ~~1110.3.3~~ 1110.2.3 as applicable.~~

~~**1110.3.1 1110.2.1 Facilities serving Accessible units.** In Group R-2 and R-4 occupancies where recreational facilities are provided serving serve Accessible units, every recreational facility of each type serving Accessible units shall be accessible.~~

~~**1110.3.2 1110.2.2 Facilities serving Type A and Type B units in a single building.** In Group R-2, R-3 and R-4 occupancies where recreational facilities are provided serving serve a single building containing Type A units or Type B units, 25 percent, but not less than one, of each type of recreational facility shall be accessible. Every recreational facility of each type on a site shall be considered to determine the total number of each type that is required to be accessible.~~

~~**1110.3.3 1110.2.3 Facilities serving Type A and Type B units in multiple buildings.** In Group R-2, R-3 and R-4 occupancies on a single site where multiple buildings containing Type A units or Type B units are served by recreational facilities, 25 percent, but not less than one, of each type of recreational facility serving each building shall be accessible. The total number of each type of recreational facility that is required to be accessible shall be determined by considering every recreational facility of each type serving each building on the site.~~

**1110.3 Other occupancies.** *All recreational facilities not falling within the purview of Section 1110.2 shall be accessible.*

**1110.4 Recreational facilities.** Recreational facilities *shall be required to be accessible and be on an accessible route to the extent specified in this section.*

**~~1110.4.1~~ 1110.4.1 Areas of sports activity.** *Each area ~~of~~ of sport activity ~~is required to~~ shall be on an accessible route and shall not be required to be accessible except as provided for in ~~Section 1110.4.1~~ Sections 1110.4.2 through 1110.4.15.*

**~~1110.4.1~~ 1110.4.2 Team or player seating.** At least one wheelchair space shall be provided in team or player seating areas serving areas of sport activity.

**Exception:** Wheelchair spaces shall not be required in team or player seating areas serving bowling lanes that are not required to be accessible ~~route~~ in accordance with Section ~~1110.4.2~~ 1110.4.3.

**~~1110.4.2~~ 1110.4.3 Bowling lanes.** An accessible route shall be provided to at least 5 percent, but no less than one, of each type of bowling lane.

**~~1110.4.3~~ 1110.4.4 Court sports.** In court sports, at least one accessible route shall directly connect both sides of the court.

**~~1110.4.4~~ 1110.4.5 Raised boxing or wrestling rings.** Raised boxing or wrestling rings are not required to be accessible *or to be on an accessible route.*

**~~1110.4.5~~ 1110.4.6 Raised refereeing, judging and scoring areas.** Raised structures used solely for refereeing, judging or scoring a sport are not required to be accessible *or to be on an accessible route.*

**~~1110.4.6~~ 1110.4.7 Animal Containment Areas.** *Animal containment areas that are not ~~for~~ within public use areas are not required to be accessible or to be on an accessible route.*

~~1110.4.7~~ **1110.4.8 Amusement rides.** Amusement rides that move persons through a fixed course within a defined area shall comply with ~~Section 1110.4.7.1~~ Sections **1110.4.8.1** through ~~1110.4.7.2~~ **1110.4.8.3**.

**Exception:** Mobile or portable amusement rides shall not be required to be accessible.

~~1110.4.7.1~~ **1110.4.8.1 Load and unload areas.** Load and unload areas serving amusement rides shall be accessible and be on an accessible route. Where load and unload areas have more than one loading or unloading position, at least one loading and unloading position shall be on an accessible route.

~~1110.4.7.1.1~~ **1110.4.8.1.1 Wheelchair spaces, ride seats designed for transfer, and transfer devices.** Where amusement rides are in the load and unload position, the position serving a wheelchair ~~spaces~~ space, for amusement ride seats designed for transfer and transfer devices shall be on an accessible route.

~~1110.4.7.2~~ **1110.4.8.2 Minimum number.** Amusement rides shall provide at least one wheelchair space, ~~or at least one~~ amusement ride seat designed for transfer, or ~~at least one~~ transfer device.

**Exceptions:**

1. Amusement rides that are controlled or operated by the rider ~~shall not be~~ are not required to comply with this section.
2. Amusement rides designed primarily for children, where children are assisted on and off the ride by an adult, ~~shall~~ are not be required to comply with this section.
3. Amusement rides that do not provide ~~amusement ride~~ seats that are built-in or mechanically fastened shall not be required to comply with this section.

~~1110.4.8~~ **1110.4.9 Recreational Boating Facilities.** Boat slips required to be accessible by ~~Section 1110.4.8.1~~ Sections **1110.4.9.1** and ~~1110.4.8.2~~ **1110.4.9.2** and boarding piers at boat launch ramps required to be accessible by ~~Section 1110.4.8.3~~ **1110.4.9.3** shall be on an accessible route.

~~1110.4.8.1~~ **1110.4.9.1 Boat Slips.** Accessible boat slips shall be provided in accordance with Table ~~1110.4.8.1~~ **1110.4.9.1**. All units on the site shall be combined to determine the number of accessible ~~boat~~ boat slips required. Where the number of boat slips is not identified, each 40 feet

(12 m) of boat slip edge provided along the perimeter of the pier shall be counted as one boat slip for the purpose of this section.

**Exception:** *Boat slips not designed for embarking or disembarking are not required to be accessible or be on an accessible route.*

**TABLE ~~110.4.8.1~~ 1110.4.9.1**  
**BOAT SLIPS**

<b>Total Number of Boating Slips Provided</b>	<b>Minimum Number of Required Accessible Boating Slips</b>
1 to 25	1
26 to 50	2
51 to 100	3
101 to 150	4
151 to 300	5
301 to 400	6
401 to 500	7
501 to 600	8
601 to 700	9
701 to 800	10
801 to 900	11
901 to 1000	12
1001 and over	12, plus 1 for every 100, or fraction thereof, over 1000

**1110.4.8.2 1110.4.9.2 Dispersion.** Accessible boat slips shall be dispersed throughout the various types of boat slips provided. Where the minimum number of accessible boat slips ~~1~~ has been met, no further dispersion shall be required.

**1110.4.8.3 1110.4.9.3 Boarding Piers at Boat Launch Ramps.** Where boarding piers are provided at boat launch ramps, at least 5 percent, but no fewer than one, of the boarding piers shall be accessible.

**1110.4.9 1110.4.10 Exercise Machines and Equipment.** At least one of each type of exercise machines and equipment shall be on an accessible route.

**1110.4.10 1110.4.11 Fishing Piers and Platforms.** Fishing piers and platforms shall be accessible and be on an accessible route.

**1110.4.11 Golf Facilities.** ~~Buildings and amenities serving a golf course, such as parking areas, golf cart rental stations, toilet rooms, clubhouses and other structures shall be accessible and be located on an accessible route.~~

~~**1110.4.11.1 Golf Courses.** Golf course elements directly associated with practicing and playing the golf course such as the tee grounds, tee boxes, putting greens, golf cart paths, practice putting greens, practice teeing grounds, and teeing stations at driving ranges are not regulated by this code.~~

~~Provisions of the federal law, contained within the 2010 ADA Standards for Accessible Design, sections 238 and 1006, apply to the golf course and contain requirements for regulating the design of the golf course which are outside the scope of this code.~~

**1110.4.12 Miniature golf facilities.** Miniature golf facilities shall comply with 1110.4.12.1 through 1110.4.12.3.

**1110.4.12.1 Minimum Number.** At least 50 percent of holes on miniature golf courses shall be accessible.

**1110.4.12.2 Miniature Golf Course Configuration.** Miniature golf courses shall be configured so that the accessible holes are consecutive. Miniature golf courses shall provide an accessible route from the last accessible hole to the course entrance or exit without requiring travel through any other holes on the course.

**Exception:** One break in the sequence of consecutive holes shall be permitted provided that the last hole on the miniature golf course is the last hole in the sequence.

**1110.4.12.3 Accessible route.** Holes required to comply with 1110.4.12.1, including the start of play, shall be on an accessible route.

**1110.4.13 Play Areas.** Play areas containing play components designed and constructed for children shall be accessible and be located on an accessible route.

**1110.4.14 Swimming pools, wading pools, hot tubs and spas.** Swimming pools, wading pools, hot tubs and spas shall be accessible and be on an accessible route.

**Exceptions:**

1. Catch Pools or a designated section of a pool ~~uses~~ used as a terminus for a water slide flume shall not be required to provide an

*accessible means of entry provided that a portion of the catch pool edge is on an accessible route.*

2. *Where spas or hot tubs are provided in a cluster, ~~no more than~~ at least 5 percent, but no fewer less than one, ~~spas spa~~ or hot ~~tubs tub~~ in each cluster shall be accessible and be on an accessible route.*
3. *Swimming pools, wading pools, spas and hot tubs that are required to be accessible by 1110.2.2 and 1110.2.3 are not required to provide accessible means of entry into the water.*

**1110.4.14.1 Raised diving boards and diving platforms.** Raised diving boards and diving platforms are not required to be accessible or to be on an accessible route.

**1110.4.14.2 Water Slides.** *Water slides are not ~~be~~ required to be accessible or to be on an accessible route.*

**1110.4.15 Shooting Facilities with Firing Positions.** Where shooting facilities with firing positions are designed and constructed at a site, at least 5 percent, but no fewer *less* than one, of each type of firing position shall be accessible and be ~~located~~ on an accessible route.

**1110.4.16 Golf Facilities.** *Buildings and amenities serving a golf course, such as parking areas, golf cart rental stations, toilet rooms, clubhouses and other structures shall be accessible and be located on an accessible route.*

**1110.4.16.1 Golf Courses.** *Golf course elements directly associated with practicing and playing the golf course such as the tee grounds, tee boxes, putting greens, golf cart paths, practice putting greens, practice teeing grounds, and teeing stations at driving ranges are not regulated by this code.*

*Provisions of the federal law, contained within the 2010 ADA Standards for Accessible Design, sections 238 and 1006, apply to the golf course and contain requirements for regulating the design of the golf course which are outside the scope of this code.*

## SECTION 1111 SIGNAGE

**1111.1 Signs.** Required accessible elements shall be identified by the International Symbol of Accessibility at the following locations:

1. Accessible parking spaces required by Section 1106.
2. In Group I-1, R-2 and R-3 facilities, where parking spaces are assigned to specific dwelling units or sleeping units, identification of accessible parking spaces shall not be required.
- ~~2.3.~~ Accessible passenger loading zones.
- ~~3.4.~~ Accessible rooms where multiple single-user toilet or bathing rooms are clustered at a single location.
- ~~4.5.~~ Accessible entrances where not all entrances are accessible.
- ~~5.6.~~ Accessible check-out aisles where not all aisles are accessible. The sign, where provided, shall be above the check-out aisle in the same location as the check-out aisle number or type of check-out identification.
- ~~6.7.~~ Family or assisted use toilet and bathing rooms.
- ~~7.8.~~ Accessible dressing, fitting and locker rooms where not all such rooms are accessible.
- ~~8.9.~~ Accessible areas of refuge in accordance with Section 1007.9.
- ~~9.10.~~ Exterior areas for assisted rescue in accordance with Section 1007.9.
11. In recreational facilities, lockers that are required to be accessible in accordance with Section 1109.9.

**1111.1.1 Signs to designate accessible parking spaces and passenger loading zones.** *Accessible parking spaces, van-accessible spaces and passenger loading zones required by section 1106 to be reserved for individuals with disabilities, shall be provided with a sign mounted on a fixed or movable post or otherwise affixed in a vertical position so that the sign is clearly visible to the driver of a vehicle when parked in such a location. A notice shall be affixed to this sign or posted adjacent to it that states the amount of the fine established by section 4511.99 of the Revised Code for the offense of parking a vehicle in this location if it is not legally entitled to do so.*

*Note: The fine established by section 4511.99 of the Revised Code shall be not less than two hundred fifty dollars nor more than five hundred dollars.*

**1111.2 Directional signage.** Directional signage indicating the route to the nearest like accessible element shall be provided at the following locations. These directional signs shall include the International Symbol of Accessibility and sign characters shall meet the visual character requirements in accordance with ICC A117.1:

1. Inaccessible building entrances.
2. Inaccessible public toilets and bathing facilities.
3. Elevators not serving an accessible route.

4. At each separate-sex toilet and bathing room indicating the location of the nearest *family/assisted use* toilet or bathing room where provided in accordance with Section 1109.2.1.
5. At exits and exit stairways serving a required accessible space, but not providing an approved accessible means of egress, signage shall be provided in accordance with Section 1007.10.
6. Where drinking fountains for persons using wheelchairs and drinking fountains for standing persons are not located adjacent to each other, directional signage shall be provided indicating the location of the other drinking fountains.

**1111.3 Other signs.** Signage indicating special accessibility provisions shall be provided as shown:

1. Each assembly area required to comply with Section 1108.2.7 shall provide a sign notifying patrons of the availability of assistive listening systems complying with the ICC A117.1 requirements for visual characters and shall include the “International Symbol for Access for Hearing Loss”.
  - Exception:** Where ticket offices or windows are provided, signs are not required at each assembly area provided that signs are displayed at each ticket office or window informing patrons of the availability of assistive listening systems.
2. At each door to an area of refuge, an exterior area for assisted rescue, an egress stairway, exit passageway and exit discharge, signage shall be provided in accordance with Section 1011.4.
3. At areas of refuge, signage shall be provided in accordance with Section 1007.11.
4. At exterior areas for assisted rescue, signage shall be provided in accordance with Section 1007.11.
5. At two-way communication systems, signage shall be provided in accordance with Section 1007.8.2.
6. Within *interior exit stairways and ramps*, floor level signage shall be provided in accordance with Section ~~1022.9~~1022.8.
7. Signs identifying the type of access provided on amusement rides required to be accessible by Section 1110 shall be provided at entries to queues and waiting lines. In addition, where accessible unload areas also serve as accessible load areas, signs indicating the location of the accessible load and unload areas shall be provided at entries to queues and waiting lines. The directional sign characters shall meet the visual character requirements in accordance with ICC A117.1.

**1111.4 Variable Message Signs.** Where provided in the locations in Sections 1111.4.1 and 1111.4.2, Variable Message Signs (VMS) shall comply with the VMS requirements of ICC A117.1

**1111.4.1 Transportation facilities.** Where provided in transportation facilities, variable message signs conveying transportation related information shall comply with Section 1111.4.

**1111.4.2 Emergency shelters.** Where provided in buildings that are designated as emergency shelters, variable message signs conveying emergency related information shall comply with Section 1111.4.

**Exception:** Where equivalent information is provided in an audible manner, VMS signs are not required to comply with ICC A117.1.

### **Section 1112.0 Modifications to ICC/ANSI A117.1.**

**1112.1 General.** The text and content of ICC A117.1 shall be modified as indicated in Sections 1112.2 through 1112.5

**1112.2 Changes to ICC A117.1, Chapter 3.** Modify the following:

1. Change the description of figure 302.2 to read: **CARPET PILE HEIGHT**
2. Change the description of figure 302.3 to read: **ELONGATED OPENINGS IN FLOOR OR GROUND SURFACES**
3. Change the description of figure 303.2 to read: **VERTICAL CHANGE IN LEVEL**

**1112.3 Changes to ICC A117.1, Chapter 4.** Modify the following:

1. Change the section description for Section 404 to: **404 Doors, Doorways and Gates**
2. Change Section 404.1 to read: **General.** Doors, doorways and gates that are part of the accessible route shall comply with Section 404. Gates shall comply with the requirements for doors.
3. Delete the following: Sections 406.12; 406.13; and, 406.14.

**1112.4 Changes to ICC A117.1, Chapter 6.** Modify the following:

1. Change the last sentence in Section 603.3 to read: Where mirrors are located above counters that do not contain lavatories, the mirror shall be mounted with the bottom edge of the reflecting

*surface 35 inches (890 mm) maximum above the floor. (Remainder of section and exception to remain unchanged).*

- 2. Change Section 604.10.2 to read: **Size.** The minimum area of an ambulatory accessible compartment shall be 60 inches (1525 mm) minimum in depth and a width of 35 inches (890 mm) minimum and 37 inches (940 mm) maximum.*

***1112.5 Changes to ICC A117.1, Chapter 11. Modify the following:***

- 1. Delete the following: The entire Section 1106.*

Effective: 03/01/2013

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CERTIFIED ELECTRONICALLY

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Certification

02/08/2013

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Date

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1/1/02, 8/15/03, 3/1/05, 9/6/05, 7/1/07, 11/1/07,  
1/1/09, 11/1/11, 3/15/12

**4101:1-30-01 Elevators and conveying systems.**

*[Comment: When a reference is made within this rule to a federal statutory provision, an industry consensus standard, or any other technical publication, the specific date and title of the publication as well as the name and address of the promulgating agency are listed in rule 4101:1-35-01 of the Administrative Code. The application of the referenced standards shall be limited and as prescribed in section 102.5 of rule 4101:1-1-01 of the Administrative Code.]*

**SECTION 3001  
GENERAL**

**3001.1 Scope.** This chapter governs the design, construction, installation, alteration and repair of elevators, *escalators, vertical and inclined wheel chair lifts, dumbwaiters, moving walks, stair lifts, and belt manlifts, including the elevator hoistway enclosures, the elevator machine rooms, the elevator hoistway venting systems, and the emergency systems that interface with them.* This chapter also governs the enclosure and related building and system requirements for conveyor and conveying systems, but does not regulate the design, construction, or installation of material-handling conveyors within the scope of ASME B20.1.

**3001.2 Referenced standards.** The design, construction, installation, alteration, repair, *inspection,* and maintenance of elevators, *escalators, vertical and inclined wheel chair lifts, dumbwaiters, moving walks, stair lifts, belt manlifts* and their components shall conform to the “Ohio Elevator Code” as listed in Chapter 35 and to ASCE 24 for construction in flood hazard areas established in Section 1612.3.

**3001.3 Accessibility.** *All new passenger elevators, escalators, and vertical and inclined wheel chair lifts shall conform to the accessibility requirements of Chapter 11.*

**3001.4 Change in use.** A change in use of an elevator from freight to passenger, passenger to freight, or from one freight class to another freight class shall comply with the “Ohio Elevator Code” as listed in Chapter 35.

**3001.5 Where required.** *This chapter does not prescribe when elevators are required, but merely prescribes the requirements for elevators when they are installed, whether for accessibility purposes (section 1104), accessible means of egress purposes (section 1007), fire service access purposes (section 403.6.1), occupant evacuation purposes (section 403.6.2), or for convenience to the occupants.*

## **SECTION 3002 HOISTWAY ENCLOSURES**

**3002.1 Hoistway enclosure protection.** Elevator, dumbwaiter and other hoistway enclosures shall be shaft enclosures complying with Section 708.

**3002.1.1 Opening protectives.** Openings in hoistway enclosures shall be protected as required in Chapter 7.

**Exception:** 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.

**3002.1.2 Hardware.** Hardware on opening protectives shall be of an approved type installed as tested, except that approved interlocks, mechanical locks and electric contacts, door and gate electric contacts and door-operating mechanisms shall be exempt from the fire test requirements.

**3002.2 Number of elevator cars in a hoistway.** Where four or more elevator cars serve all or the same portion of a building, the elevators shall be located in at least two separate hoistways. Not more than four elevator cars shall be located in any single hoistway enclosure.

**3002.3 Emergency signs.** An approved pictorial sign of a standardized design shall be posted adjacent to each elevator call station on all floors instructing occupants to use the exit stairways and not to use the elevators in case of fire. The sign shall read: IN FIRE EMERGENCY, DO NOT USE ELEVATOR. USE EXIT STAIRS.

**Exceptions:**

1. The emergency sign shall not be required for elevators that are part of an accessible means of egress complying with Section 1007.4.
2. The emergency sign shall not be required for elevators that are used for occupant self-evacuation in accordance with Section 3008.

**3002.4 Elevator car to accommodate ambulance stretcher.** Where elevators are provided in buildings four or more stories above, or four or more stories below, grade plane, at least one elevator shall be provided for fire department emergency access to all floors. The elevator car shall be of such a size and arrangement to accommodate an ambulance stretcher 24 inches by 84 inches (610 mm by 2134 mm) with not less than 5-inch (127 mm) radius corners, in the horizontal, open position and shall be identified by the international symbol for emergency medical services (star of life). The symbol shall not be less than 3 inches (76 mm) high and shall be placed inside on both sides of the hoistway door frame.

**3002.5 Emergency doors.** Where an elevator is installed in a single blind hoistway or on the outside of a building, there shall be installed in the blind

portion of the hoistway or blank face of the building, an emergency door in accordance with *the "Ohio Elevator Code" as listed in Chapter 35.*

**3002.6 Prohibited doors.** Doors, other than hoistway doors and the elevator car door, shall be prohibited at the point of access to an elevator car unless such doors are readily openable from the car side without a key, tool, special knowledge or effort.

**3002.7 Common enclosure with stairway.** Elevators shall not be in a common shaft enclosure with a stairway.

**Exception:** Open parking garages.

**3002.8 Glass in elevator enclosures.** Glass in elevator enclosures shall comply with Section 2409.1.

### **SECTION 3003 EMERGENCY OPERATIONS**

**3003.1 Standby power.** In buildings and structures where standby power is required or furnished to operate an elevator, the operation shall be in accordance with Sections 3003.1.1 through 3003.1.4.

**3003.1.1 Manual transfer.** Standby power shall be manually transferable to all elevators in each bank.

**3003.1.2 One elevator.** Where only one elevator is installed, the elevator shall automatically transfer to standby power within 60 seconds after failure of normal power.

**3003.1.3 Two or more elevators.** Where two or more elevators are controlled by a common operating system, all elevators shall automatically transfer to standby power within 60 seconds after failure of normal power where the standby power source is of sufficient capacity to operate all elevators at the same time. Where the standby power source is not of sufficient capacity to operate all elevators at the same time, all elevators shall transfer to standby power in sequence, return to the designated landing and disconnect from the standby power source. After all elevators have been returned to the designated level, at least one elevator shall remain operable from the standby power source.

**3003.1.4 Venting.** Where standby power is connected to elevators, the machine room ventilation or air conditioning shall be connected to the standby power source.

**3003.2 Fire-fighters' emergency operation.** Elevators shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with *the "Ohio Elevator Code" and NFPA 72 as listed in Chapter 35.*

## SECTION 3004 HOISTWAY VENTING

**3004.1 Vents required.** Hoistways of elevators and dumbwaiters penetrating more than three stories shall be provided with a means for venting smoke and hot gases to the outer air in case of fire.

**Exceptions:**

1. In occupancies of other than Groups R-1, R-2, I-1, I-2 and similar occupancies with overnight sleeping units, venting of hoistways is not required where the building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Sidewalk elevator hoistways are not required to be vented.
3. Elevators contained within and serving open parking garages only.
4. Elevators within individual residential dwelling units.

**3004.2 Location of vents.** Vents shall be located at the top the hoistway and shall open either directly to the outer air or through noncombustible ducts to the outer air. Noncombustible ducts shall be permitted to pass through the elevator machine room, provided that portions of the ducts located outside the hoistway or machine room are enclosed by construction having not less than the fire-resistance rating required for the hoistway. Holes in the machine room floors for the passage of ropes, cables or other moving elevator equipment shall be limited as not to provide greater than 2 inches (51 mm) of clearance on all sides.

**3004.3 Area of vents.** Except as provided for in Section 3004.3.1, the area of the vents shall not be less than 3 ½ percent of the area of the hoistway nor less than 3 square feet (0.28 m<sup>2</sup>) for each elevator car, and not less than 3 ½ percent nor less than 0.5 square feet (0.047 m<sup>2</sup>) for each dumbwaiter car in the hoistway, whichever is greater. Of the total required vent area, not less than one-third shall be permanently open. Closed portions of the required vent area shall consist of openings glazed with annealed glass not greater than 1/8 inch (3.2 mm) in thickness.

**Exception:** The total required vent area shall not be required to be permanently open where all the vent openings automatically open upon detection of smoke in the elevator lobbies or hoistway, upon power failure and upon activation of a manual override control. The manual override control shall be capable of opening and closing the vents and shall be located in an approved location.

**3004.3.1 Reduced vent area.** Where mechanical ventilation conforming to the *mechanical code* is provided, a reduction in the required vent area is allowed provided that all of the following conditions are met:

1. The occupancy is not in Group R-1, R-2, I-1 or I-2 or of a similar occupancy with overnight sleeping units.
2. The vents required by Section 3004.2 do not have outside exposure.
3. The hoistway does not extend to the top of the building.
4. The hoistway and machine room exhaust fan is automatically reactivated by thermostatic means.
5. Equivalent venting of the hoistway is accomplished.

**3004.4 Plumbing and mechanical systems.** Plumbing and mechanical systems shall not be located in an elevator shaft.

**Exception:** Floor drains, sumps and sump pumps shall be permitted at the base of the shaft provided they are indirectly connected to the plumbing system *in accordance with the plumbing code.*

## SECTION 3005 CONVEYING SYSTEMS

**3005.1 General.** Escalators, moving walks, conveyors, personnel hoists and material hoists shall comply with the provisions of this section.

**3005.2 Escalators and moving walks.** Escalators and moving walks shall be constructed of approved noncombustible and fire-retardant materials. This requirement shall not apply to electrical equipment, wiring, wheels, handrails and the use of <sup>1</sup>/<sub>28</sub>-inch (0.9 mm) wood veneers on balustrades backed up with noncombustible materials.

**3005.2.1 Enclosure.** Escalator floor openings shall be enclosed with shaft enclosures complying with Section 708.

**3005.2.2 Escalators.** Where provided in below-grade transportation stations, escalators shall have a clear width of 32 inches (815 mm) minimum.

**Exception:** The clear width is not required in existing facilities undergoing alterations.

**3005.3 Conveyors.** *Buildings containing material-handling conveyors and conveying systems shall be provided with safety features as required in Sections 3005.3.1 and 3005.3.2.*

**3005.3.1 Enclosure.** Conveyors and related equipment connecting successive floors or levels shall be enclosed with shaft enclosures complying with Section 708.

**3005.3.2 Conveyor safeties.** Power-operated conveyors, belts and other material-moving devices shall be equipped with automatic limit switches which will shut off the power in an emergency and automatically stop all operation of the device.

**3005.4 Personnel and material hoists.** Personnel and material hoists shall be designed utilizing an approved method that accounts for the conditions imposed

during the intended operation of the hoist device. The design shall include, but is not limited to, anticipated loads, structural stability, impact, vibration, stresses and seismic restraint. The design shall account for the construction, installation, operation and inspection of the hoist tower, car, machinery and control equipment, guide members and hoisting mechanism. Additionally, the design of personnel hoists shall include provisions for field testing and maintenance which will demonstrate that the hoist device functions in accordance with the design. Field tests shall be conducted upon the completion of an installation or following a major alteration of a personnel hoist.

### **SECTION 3006 MACHINE ROOMS**

**3006.1 Access.** An approved means of access shall be provided to elevator machine rooms and overhead machinery spaces.

**3006.2 Venting.** Elevator machine rooms that contain solid-state equipment for elevator operation shall be provided with an independent ventilation or air-conditioning system to protect against the overheating of the electrical equipment. The system shall be capable of maintaining temperatures within the range established for the elevator equipment.

**3006.3 Pressurization.** The elevator machine room serving a pressurized elevator hoistway shall be pressurized upon activation of a heat or smoke detector located in the elevator machine room.

**3006.4 Machine rooms and machinery spaces.** Elevator machine rooms and machinery spaces shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. The fire-resistance rating shall not be less than the required rating of the hoistway enclosure served by the machinery. Openings in the fire barriers shall be protected with assemblies having a fire protection rating not less than that required for the hoistway enclosure doors.

**Exceptions:**

1. Where machine rooms and machinery spaces do not abut and have no openings to the hoistway enclosure they serve the fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both, shall be permitted to be reduced to a 1-hour fire-resistance rating.
2. In buildings four stories or less above grade plane when machine room and machinery spaces do not abut and have no openings to the hoistway enclosure they serve, the machine room and machinery spaces are not required to be fire-resistance rated.

**3006.5 Shunt trip.** Where elevator hoistways or elevator machine rooms containing elevator control equipment are protected with automatic sprinklers, a means installed in accordance with NFPA 72, Section ~~6.16.4~~ 21.4, Elevator Shutdown, shall be provided to disconnect automatically the main line power supply to the affected elevator prior to the application of water. This means shall not be self-resetting. The activation of sprinklers outside the hoistway or machine room shall not disconnect the main line power supply.

**3006.6 Plumbing systems.** Plumbing systems shall not be located in elevator equipment rooms.

## **SECTION 3007 FIRE SERVICE ACCESS ELEVATOR**

**3007.1 General.** Where required by Section 403.6.1, every floor of the building shall be served by a fire service access elevator. Except as modified in this section, the fire service access elevator shall be installed in accordance with this chapter and the “Ohio Elevator Code” as listed in Chapter 35.

**3007.2 Hoistway enclosures protection.** The fire service access elevator shall be located in a shaft enclosure complying with Section 708.

**3007.3 Hoistway lighting.** When firefighters’ emergency operation is active, the entire height of the hoistway shall be illuminated at not less than 1 foot-candle (11 lux) as measured from the top of the car of each fire service access elevator.

**3007.4 Fire service access elevator lobby.** The fire service access elevator shall open into a fire service access elevator lobby in accordance with Sections 3007.4.1 through 3007.4.4.

**Exception:** Where a fire service access elevator has two entrances onto a floor, the second entrance shall be permitted to open into an elevator lobby in accordance with Section 708.14.1.

**3007.4.1 Access.** The fire service access elevator lobby shall have direct access to an exit enclosure.

**3007.4.2 Lobby enclosure.** The fire service access elevator lobby shall be enclosed with a smoke barrier having a minimum 1-hour fire-resistance rating, except that lobby doorways shall comply with Section 3007.4.3.

**Exception:** Enclosed fire service access elevator lobbies are not required at the street floor.

**3007.4.3 Lobby doorways.** Each fire service access elevator lobby shall be provided with a doorway that is protected with a  $\frac{3}{4}$ -hour fire door assembly complying with Section 715.4. The fire door assembly shall also comply with the smoke and draft control door assembly requirements of Section 715.4.3.1 with the UL 1784 test conducted without the artificial bottom seat.

- 3007.4.4 Lobby size.** Each enclosed fire service access elevator lobby shall be a minimum of 150 square feet (14 m<sup>2</sup>) in area with a minimum dimension of 8 feet (2440 mm).
- 3007.5 Standpipe hose connection.** A Class I standpipe hose connection in accordance with Section 905 shall be provided in the exit enclosure having direct access from the fire service access elevator lobby.
- 3007.6 Elevator system monitoring.** The fire service access elevator shall be continuously monitored at the fire command center by a standard emergency service interface system meeting the requirements of NFPA 72.
- 3007.7 Electrical power.** The following features serving each fire service access elevator shall be supplied by both normal power and Type 60/Class 2/Level 1 standby power:
1. Elevator equipment.
  2. Elevator hoistway lighting.
  3. Elevator machine room ventilation and cooling equipment.
  4. Elevator controller cooling equipment.
- 3007.7.1 Protection of wiring or cables.** Wires or cables that provide normal and standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum 1-hour fire-resistance rating or shall be circuit integrity cable having a minimum 1-hour fire-resistance rating.

## SECTION 3008 OCCUPANT EVACUATION ELEVATORS

- 3008.1 General.** Where elevators are to be used for occupant self-evacuation during fires, all passenger elevators for general public use shall comply with this section. Where other elevators are used for occupant self-evacuation, they shall also comply with this section.
- 3008.2 Fire safety and evacuation plan.** The building shall have an approved fire safety and evacuation plan in accordance with the applicable requirements of Section 404 of the *fire code*. The fire safety and evacuation plan shall incorporate specific procedures for the occupants using evacuation elevators.
- 3008.3 Operation.** The occupant evacuation elevators shall be used for occupant self-evacuation only in the normal elevator operating mode prior to Phase I Emergency Recall Operation in accordance with the requirements in the "*Ohio Elevator Code*" listed in Chapter 35 and the building's fire safety and evacuation plan.
- 3008.4 Additional exit stairway.** Where an additional means of egress is required in accordance with Section 403.5.2, an additional exit stairway shall not

be required to be installed in buildings having elevators used for occupant self-evacuation in accordance with this section.

**3008.5 Emergency voice/alarm communication system.** The building shall be provided with an emergency voice/alarm communication system. The emergency voice/alarm communication system shall be accessible to the fire department. The system shall be provided in accordance with Section 907.5.2.2.

**3008.5.1 Notification appliances.** A minimum of one audible and one visible notification appliance shall be installed within each occupant evacuation elevator lobby.

**3008.6 Automatic sprinkler system.** The building shall be protected throughout by an approved, electrically-supervised automatic sprinkler system in accordance with Section 903.3.1.1, except as otherwise permitted by Section 903.3.1.1.1 and as prohibited by Section 3008.6.1.

**3008.6.1 Prohibited locations.** Automatic sprinklers shall not be installed in elevator machine rooms and elevator machine spaces for occupant evacuation elevators.

**3008.6.2 Sprinkler system monitoring.** The sprinkler system shall have a sprinkler control valve supervisory switch and waterflow-initiating device provided for each floor that is monitored by the building's fire alarm system.

**3008.7 High-hazard content areas.** No building areas shall contain high-hazard contents exceeding the maximum allowable quantities per control area as addressed in Section 414.2.

**3008.8 Shunt trip.** Means for elevator shutdown in accordance with Section 3006.5 shall not be installed on elevator systems used for occupant evacuation elevators.

**3008.9 Hoistway enclosure protection.** The occupant evacuation elevators shall be located in hoistway enclosure(s) complying with Section 708.

**3008.10 Water protection.** The occupant evacuation elevator hoistway shall be designed utilizing an approved method to prevent water from the operation of the automatic sprinkler system from infiltrating into the hoistway enclosure.

**3008.11 Occupant evacuation elevator lobby.** The occupant evacuation elevators shall open into an elevator lobby in accordance with Sections 3008.11.1 through 3008.11.4.

**3008.11.1 Access.** The occupant evacuation elevator lobby shall have direct access to an exit enclosure.

**3008.11.2 Lobby enclosure.** The occupant evacuation elevator lobby shall be enclosed with a smoke barrier having a minimum 1-hour fire-resistance rating, except that lobby doorways shall comply with Section 3008.11.5.

**Exception:** Enclosed occupant evacuation elevator lobbies are not required at the level(s) of exit discharge.

**3008.11.3 Lobby doorways.** Each occupant evacuation elevator lobby shall be provided with a doorway that is protected with a  $3/4$ -hour fire door assembly complying with Section 715.4.

**3008.11.3.1 Vision panel.** A vision panel shall be installed in each fire door assembly protecting the lobby doorway. The vision panel shall consist of fire-protection-rated glazing and shall be located to furnish clear vision of the occupant evacuation elevator lobby.

**3008.11.3.2 Door closing.** Each fire door assembly protecting the lobby doorway shall be automatic-closing upon receipt of any fire alarm signal from the emergency voice/alarm communication system serving the building.

**3008.11.4 Lobby size.** Each occupant evacuation elevator lobby shall have minimum floor area as follows:

1. The occupant evacuation elevator lobby floor area shall accommodate, at 3 square feet ( $0.28 \text{ m}^2$ ) per person, a minimum of 25 percent of the occupant load of the floor area served by the lobby.
2. The occupant evacuation elevator lobby floor area also shall accommodate one wheelchair space of 30 inches by 48 inches (760 mm by 1220 mm) for each 50 persons, or portion thereof, of the occupant load of the floor area served by the lobby.

**Exception:** The size of lobbies serving multiple banks of elevators shall have the minimum floor area approved on an individual basis and shall be consistent with the building's fire safety and evacuation plan.

**3008.11.5 Signage.** An approved sign indicating elevators are suitable for occupant self-evacuation shall be posted on all floors adjacent to each elevator call station serving occupant evacuation elevators. *Signage shall comply with "ADAAG" Chapter 11 and ICC A117.1.*

**3008.12 Lobby status indicator.** Each occupant evacuation elevator lobby shall be equipped with a status indicator arranged to display all of the following information:

1. An illuminated green light and the message, "Elevators available for occupant evacuation" when the elevators are operating in normal service and the fire alarm system is indicating an alarm in the building.
2. An illuminated red light and the message, "Elevators out of service, use exit stairs" when the elevators are in Phase I emergency recall operation in accordance with the requirements in *the "Ohio Elevator Code" as listed in Chapter 35.*
3. No illuminated light or message when the elevators are operating in normal service.

**3008.13 Two-way communication system.** A two-way communication system shall be provided in each occupant evacuation elevator lobby for the purpose of

initiating communication with the fire command center or an alternative location approved by the fire department.

**3008.13.1 Design and installation.** The two-way communication system shall include audible and visible signals and shall be designed and installed in accordance with the requirements of ~~the “Ohio Elevator Code” and “ADAAG” as listed in Chapter 35.~~ Chapter 11, ICC A117.1, NFPA 72, and the “Ohio Elevator Code.”

**3008.13.2 Instructions.** Instructions for the use of the two-way communication system along with the location of the station shall be permanently located adjacent to each station. Signage shall comply with ~~the “Ohio Elevator Code” and “ADAAG” as listed in Chapter 35.~~ Chapter 11, ICC A117.1, NFPA 72, and the “Ohio Elevator Code.”

**3008.14 Elevator system monitoring.** The occupant evacuation elevators shall be continuously monitored at the fire command center or a central control point approved by the fire department and arranged to display all of the following information:

1. Floor location of each elevator car.
2. Direction of travel of each elevator car.
3. Status of each elevator car with respect to whether it is occupied.
4. Status of normal power to the elevator equipment, elevator controller cooling equipment, and elevator machine room ventilation and cooling equipment.
5. Status of standby or emergency power system that provides backup power to the elevator equipment, elevator controller cooling equipment, and elevator machine room ventilation and cooling equipment.
6. Activation of any fire alarm-initiating device in any elevator lobby, elevator machine room or machine space, or elevator hoistway.

**3008.14.1 Elevator recall.** The fire command center or an alternative location approved by the fire department shall be provided with the means to manually initiate a Phase I Emergency Recall of the occupant evacuation elevators in accordance with ~~the “Ohio Elevator Code” as listed in Chapter 35.~~

**3008.15 Electrical power.** The following features serving each occupant evacuation elevator shall be supplied by both normal power and Type 60/Class 2/Level 1 standby power:

1. Elevator equipment.
2. Elevator machine room ventilation and cooling equipment.
3. Elevator controller cooling equipment.

**3008.15.1 Protection of wiring or cables.** Wires or cables that provide normal and standby power, control signals, communication with the car,

lighting, heating, air conditioning, ventilation and fire-detecting systems to occupant evacuation elevators shall be protected by construction having a minimum 1-hour fire-resistance rating or shall be circuit integrity cable having a minimum 1-hour fire-resistance rating.

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**4101:1-31-01 Special Construction.**

[Comment: When a reference is made within this rule to a federal statutory provision, an industry consensus standard, or any other technical publication, the specific date and title of the publication as well as the name and address of the promulgating agency are listed in rule 4101:1-35-01 of the Administrative Code. The application of the referenced standards shall be limited and as prescribed in section 102.5 of rule 4101:1-1-01 of the Administrative Code.]

**SECTION 3101**  
**GENERAL**

**3101.1 Scope.** The provisions of this chapter shall govern special building construction including membrane structures, temporary structures, pedestrian walkways and tunnels, automatic vehicular gates, awnings and canopies, marquees, signs, and towers and antennas.

**SECTION 3102**  
**MEMBRANE STRUCTURES**

**3102.1 General.** The provisions of this section shall apply to air-supported, air-inflated, membrane-covered cable and membrane-covered frame structures, collectively known as membrane structures, erected for a period of 180 days or longer. Those erected for a shorter period of time shall comply with the fire code. Membrane structures covering water storage facilities, water clarifiers, water treatment plants, sewage treatment plants, greenhouses and similar facilities not used for human occupancy are required to meet only the requirements of Sections 3102.3.1 and 3102.7. Membrane structures erected on a building, balcony, deck or other structure for any period of time shall comply with this section.

**3102.2 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.

**AIR-INFLATED STRUCTURE.** A structure that uses air-pressurized membrane beams, arches or other elements to enclose space. Occupants of such a structure do not occupy the pressurized area used to support the structure.

**AIR-SUPPORTED STRUCTURE.** A building wherein the shape of the structure is attained by air pressure and occupants of the structure are within the elevated pressure area. Air-supported structures are of two basic types:

**Double skin.** Similar to a single skin, but with an attached liner that is separated from the outer skin and provides an airspace which serves for insulation, acoustic, aesthetic or similar purposes.

**Single skin.** Where there is only the single outer skin and the air pressure is directly against that skin.

**CABLE-RESTRAINED, AIR-SUPPORTED STRUCTURE.** A structure in which the uplift is resisted by cables or webbings which are anchored to either foundations or dead men. Reinforcing cable or webbing is attached by various methods to the membrane or is an integral part of the membrane. This is not a cable-supported structure.

**MEMBRANE-COVERED CABLE STRUCTURE.** A nonpressurized structure in which a mast and cable system provides support and tension to the membrane weather barrier and the membrane imparts stability to the structure.

**MEMBRANE-COVERED FRAME STRUCTURE.** A nonpressurized building wherein the structure is composed of a rigid framework to support a tensioned membrane which provides the weather barrier.

**NONCOMBUSTIBLE MEMBRANE STRUCTURE.** A membrane structure in which the membrane and all component parts of the structure are noncombustible.

**TENT.** *A structure, enclosure or shelter, with or without side-walls or drops, constructed of fabric or pliable material supported by any manner except by air or the contents that it protects.*

**3102.3 Type of construction.** Noncombustible membrane structures shall be classified as Type IIB construction. Noncombustible frame or cable-supported structures covered by an *approved* membrane in accordance with Section 3102.3.1 shall be classified as Type IIB construction. Heavy timber frame-supported structures covered by an *approved* membrane in accordance with Section 3102.3.1 shall be classified as Type IV construction. Other membrane structures shall be classified as Type V construction.

**Exception:** Plastic less than 30 feet (9,144 mm) above any floor used in greenhouses, where occupancy by the general public is not authorized, and for aquaculture pond covers is not required to meet the fire propagation performance criteria of NFPA 701.

**3102.3.1 Membrane and interior liner material.** Membranes and interior liners shall be either noncombustible as set forth in Section 703.4 or meet the fire propagation performance criteria of NFPA 701 and the manufacturer's test protocol.

**Exception:** Plastic less than 20 mil (0.5 mm) in thickness used in greenhouses, where occupancy by the general public is not authorized, and for aquaculture pond covers is not required to meet the fire propagation performance criteria of NFPA 701.

**3102.4 Allowable floor areas.** The area of a membrane structure shall not exceed the limitations set forth in Table 503, except as provided in Section 506.

**3102.5 Maximum height.** Membrane structures shall not exceed one story nor shall such structures exceed the height limitations in feet set forth in Table 503.

**Exception:** Noncombustible membrane structures serving as roofs only.

**3102.6 Mixed construction.** Membrane structures shall be permitted to be utilized as specified in this section as a portion of buildings of other types of construction. Height and area limits shall be as specified for the type of construction and occupancy of the building.

**3102.6.1 Noncombustible membrane.** A noncombustible membrane shall be permitted for use as the roof or as a skylight of any building or atrium of a building of any type of construction provided it is at least 20 feet (6,096 mm) above any floor, balcony or gallery.

**3102.6.1.1 Membrane.** A membrane meeting the fire propagation performance criteria of NFPA 701 shall be permitted to be used as the roof or as a skylight on buildings of Types IIB, III, IV and V construction, provided it is at least 20 feet (6,096 mm) above any floor, balcony or gallery.

**3102.7 Engineering design.** The structure shall be designed and constructed to sustain dead loads; loads due to tension or inflation; live loads including wind, snow or flood and seismic loads and in accordance with Chapter 16.

**3102.8 Inflation systems.** Air-supported and air-inflated structures shall be provided with primary and auxiliary inflation systems to meet the minimum requirements of Sections 3102.8.1 through 3102.8.3.

**3102.8.1 Equipment requirements.** This inflation system shall consist of one or more blowers and shall include provisions for automatic control to maintain the required inflation pressures. The system shall be so designed as to prevent overpressurization of the system.

**3102.8.1.1 Auxiliary inflation system.** In addition to the primary inflation system, in buildings exceeding 1,500 square feet (140 m<sup>2</sup>) in area, an auxiliary inflation system shall be provided with sufficient capacity to maintain the inflation of the structure in case of primary system failure. The auxiliary inflation system shall operate automatically when there is a loss of internal pressure and when the primary blower system becomes inoperative.

**3102.8.1.2 Blower equipment.** Blower equipment shall meet all of the following requirements:

1. Blowers shall be powered by continuous-rated motors at the maximum power required for any flow condition as required by the structural design.
2. Blowers shall be provided with inlet screens, belt guards and other protective devices as required by the building official to provide protection from injury.
3. Blowers shall be housed within a weather-protecting structure.
4. Blowers shall be equipped with backdraft check dampers to minimize air loss when inoperative.
5. Blower inlets shall be located to provide protection from air contamination. The location of inlets shall be approved.

**3102.8.2 Standby power.** Wherever an auxiliary inflation system is required, an approved standby power-generating system shall be provided. The system shall be equipped with a suitable means for automatically starting the generator set upon failure of the normal electrical service and for automatic transfer and operation of all of the required electrical functions at full power within 60 seconds of such service failure. Standby power shall be capable of operating independently for a minimum of 4 hours.

**3102.8.3 Support provisions.** A system capable of supporting the membrane in the event of deflation shall be provided for in air-supported and air-inflated structures having an occupant load of 50 or more or where covering a swimming pool regardless of occupant load. The support system shall be capable of maintaining membrane structures used as a roof for Type I construction not less than 20 feet (6,096 mm) above floor or seating areas. The support system shall be

capable of maintaining other membranes at least 7 feet (2,134 mm) above the floor, seating area or surface of the water.

### **SECTION 3103 TEMPORARY STRUCTURES**

**3103.1 General.** The provisions of this section shall apply to structures erected for a period of less than 180 days. Tents and other membrane structures erected for a period of less than 180 days shall comply with *this section and Chapter 24 of the fire code*. Those erected for a longer period of time shall comply with applicable sections of this code.

**3103.1.1 Approval required.** Temporary structures *other than tents and membrane structures* that cover an area in excess of 120 square feet (11.16 m<sup>2</sup>), including connecting areas or spaces with a common means of egress or entrance which are used or intended to be used for the gathering together of 10 or more persons, shall not be erected, operated or maintained for any purpose without obtaining *an approval* from the building official.

**3103.1.2 Approval required for tents and membrane structures.** Temporary tents and temporary membrane structures having either of the following characteristics shall not be erected, operated or maintained for any purpose without first obtaining an approval from the building official. For the purpose of determining required distances, support ropes and guy wires shall be considered as part of the temporary tent or membrane structure.

1. An individual tent or membrane structure with an area in excess of 400 square feet (37 m<sup>2</sup>); or

2. Multiple tents or membrane structures with an aggregate area in excess of 400 square feet (37 m<sup>2</sup>) when adjacent temporary tents or membrane structures are located within 12 feet (3,658 mm) of one another.

**Exceptions:**

1. An approval is not required for tents used exclusively for recreational camping purposes.
2. An approval is not required for tents open on all sides which comply with all of the following:

- 2.1 Individual tents having a maximum size of 700 square feet (65 m<sup>2</sup>).
- 2.2 The aggregate area of multiple tents placed side by side without a fire break clearance of 12 feet (3,658 mm), not exceeding 700 square feet (65 m<sup>2</sup>) total.
- 2.3 A minimum clearance of 12 feet (3658 mm) to all structures and other tents.

**3103.2 Construction documents.** An application and construction documents shall be submitted for each installation of a temporary structure. The construction documents shall include a site plan indicating the location of the temporary structure and information delineating the means of egress and the occupant load.

**3103.3 Location.** Temporary structures shall be located in accordance with the requirements of Table 602 based on the fire-resistance rating of the exterior walls for the proposed type of construction.

**3103.4 Means of egress.** Temporary structures shall conform to the means of egress requirements of Chapter 10 and shall have a maximum exit access travel distance of 100 feet (30, 480 mm).

## **SECTION 3104 PEDESTRIAN WALKWAYS AND TUNNELS**

**3104.1 General.** This section shall apply to connections between buildings such as pedestrian walkways or tunnels, located at, above or below grade level, that are used as a means of travel by persons. The pedestrian walkway shall not contribute to the building area or the number of stories or height of connected buildings.

**3104.2 Separate structures.** Connected buildings shall be considered to be separate structures.

**Exceptions:**

1. Buildings on the same lot in accordance with Section 503.1.2.
2. For purposes of calculating the number of Type B units required by Chapter 11, structurally connected buildings and buildings with multiple wings shall be considered one structure.

**3104.3 Construction.** The pedestrian walkway shall be of noncombustible construction.

**Exceptions:**

1. Combustible construction shall be permitted where connected buildings are of combustible construction.
2. Fire-retardant-treated wood, in accordance with Section 603.1, Item 1., shall be permitted for the roof construction of the pedestrian walkway where connected buildings are a minimum of Type I or II construction.

**3104.4 Contents.** Only materials and decorations approved by the building official shall be located in the pedestrian walkway.

**3104.5 Fire barriers between pedestrian walkways and buildings.** Walkways shall be separated from the interior of the building by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. This protection shall extend vertically from a point 10 feet (3,048 mm) above the walkway roof surface or the connected building roof line, whichever is lower, down to a point 10 feet (3,048 mm) below the walkway and horizontally 10 feet (3,048 mm) from each side of the pedestrian walkway. Openings within the 10-foot (3,048 mm) horizontal extension of the protected walls beyond the walkway shall be equipped with devices providing a ¾-hour fire protection rating in accordance with Section 715.

**Exception:** The walls separating the pedestrian walkway from a connected building and the openings within the 10foot (3,048 mm) horizontal extension of the protected walls beyond the walkway are not required to have a fire-resistance rating by this section where any of the following conditions exist:

1. The distance between the connected buildings is more than 10 feet (3,048 mm). The pedestrian walkway and connected buildings, except for open parking garages, are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. The wall is capable of resisting the passage of smoke or is constructed of a tempered, wired or laminated glass wall and doors subject to the following:
  - 1.1 The wall or glass separating the interior of the building from the pedestrian walkway shall be protected by an automatic sprinkler system in accordance with Section 903.3.1.1 and the sprinkler system shall completely wet the entire surface of interior sides of the wall or glass when actuated;
  - 1.2 The glass 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 operates; and
  - 1.3 Obstructions shall not be installed between the sprinkler heads and the wall or glass.

2. The distance between the connected buildings is more than 10 feet (3,048 mm) and both sidewalls of the pedestrian walkway are at least 50 percent open with the open area uniformly distributed to prevent the accumulation of smoke and toxic gases.
3. Buildings are on the same lot in accordance with Section 503.1.2.
4. Where exterior walls of connected buildings are required by Section 705 to have a fire-resistance rating greater than 2 hours, the walkway shall be equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1  
The previous exception shall apply to pedestrian walkways having a maximum height above grade of three stories or 40 feet (12,192 mm), or five stories or 55 feet (16,764 mm) where sprinklered.

**3104.6 Public way.** Pedestrian walkways over a public way shall also comply with Chapter 32.

**3104.7 Egress.** Access shall be provided at all times to a pedestrian walkway that serves as a required exit.

**3104.8 Width.** The unobstructed width of pedestrian walkways shall not be less than 36 inches (914 mm). The total width shall not exceed 30 feet (9,144 mm).

**3104.9 Exit access travel.** The length of exit access travel shall not exceed 200 feet (60,960 mm).

**Exceptions:**

1. Exit access travel distance on a pedestrian walkway equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall not exceed 250 feet (76,200 mm).
2. Exit access travel distance on a pedestrian walkway constructed with both sides at least 50 percent open shall not exceed 300 feet (91,440 mm).
3. Exit access travel distance on a pedestrian walkway constructed with both sides at least 50 percent open, and equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall not exceed 400 feet (122 m).

**3104.10 Tunneled walkway.** Separation between the tunneled walkway and the building to which it is connected shall not be less than 2-hour fire-resistant construction and openings therein shall be protected in accordance with Table 715.4.

## SECTION 3105 AWNINGS AND CANOPIES

**3105.1 General.** Awnings or canopies shall comply with the requirements of this section and other applicable sections of this code.

**3105.2 Definitions.** The following terms shall, for the purposes of this section and as used elsewhere in this code, have the meaning shown herein.

**CANOPY.** A permanent structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration, and shall be structurally independent or supported by attachment to a building on one end and by not less than one stanchion on the outer end.

**RETRACTABLE AWNING.** A retractable awning is a cover with a frame that retracts against a building or other structure to which it is entirely supported.

**3105.3 Design and construction.** Awnings and canopies shall be designed and constructed to withstand wind or other lateral loads and live loads as required by Chapter 16 with due allowance for shape, open construction and similar features that relieve the pressures or loads. Structural members shall be protected to prevent deterioration. Awnings shall have frames of noncombustible material, fire-retardant-treated wood, wood of Type IV size, or 1-hour construction with combustible or noncombustible covers and shall be either fixed, retractable, folding or collapsible.

**3105.4 Canopy materials.** Canopies shall be constructed of a rigid framework with an approved covering that meets the fire propagation performance criteria of NFPA 701 or has a flame spread index not greater than 25 when tested in accordance with ASTM E 84 or UL 723.

## SECTION 3106 MARQUEES

**3106.1 General.** Marquees shall comply with this section and other applicable sections of this code. *Marquee signs shall comply with the provisions of section 3107.13.*

**3106.2 Thickness.** The maximum height or thickness of a marquee measured vertically from its lowest to its highest point shall not exceed 3 feet (914 mm) where the marquee projects more than two-thirds of the distance from the

property line to the curb line, and shall not exceed 9 feet (2743 mm) where the marquee is less than two-thirds of the distance from the property line to the curb line.

**3106.3 Roof construction.** Where the roof or any part thereof is a skylight, the skylight shall comply with the requirements of Chapter 24. Every roof and skylight of a marquee shall be sloped to downspouts that shall conduct any drainage from the marquee in such a manner so as not to spill onto an accessible route or a walking surface serving an exit discharge..

**3106.4 Location prohibited.** Every marquee shall be so located as not to interfere with the operation of any exterior standpipe, and such that the marquee does not obstruct the clear passage of stairways or exit discharge from the building or the installation or maintenance of street lighting.

**3106.5 Construction.** A marquee shall be supported entirely from the building and constructed of materials permitted for the construction type of the building. Marquees shall be designed as required in Chapter 16. Structural members shall be protected to prevent deterioration.

## **SECTION 3107 SIGNS**

**3107.1 General.** Signs shall be designed, constructed and maintained in accordance with this and other applicable sections in this code.

**3107.1.1 Construction documents and written consent.** Construction documents for signs shall be submitted for approval in accordance with the provisions of Chapter 1. The application for approval shall be accompanied by the written consent of the owner or lessee of the property upon which the sign is to be erected.

### **Exceptions:**

1. Signs painted directly on building surfaces.
2. Temporary yard signs.
3. Signs erected by federal, state and local transportation authorities.
4. Signs not more than 2.5 ft.<sup>2</sup> in area (0.23m<sup>2</sup>).

5. Signs required in accordance with the provisions of Chapter 11.
6. Signs undergoing minor repairs in accordance with section 102.10.2.

**3107.2 Definitions.** Unless otherwise expressly stated, the following words and terms shall, for the purposes of this section, have the meanings shown herein. Refer to Chapter 2 of this code for general definitions.

**SIGN.** Any fabricated panel or display structure or illuminated device consisting of any letter, figure, character, mark, picture, stroke, stripe, line, trademark, reading matter or other types of graphics, which is constructed, placed, attached, erected, fastened, or manufactured in a manner that is used for the attraction of the public to any place, subject, person, firm, corporation, public performance, article, machine, or merchandise, which is displayed outdoors for recognized advertising purposes. Signs shall be classified and conform to the requirements of those classifications as set forth in this code.

**COMBINATION SIGN:** A sign incorporating any combination of the features of a pole, projecting or roof sign.

**DISPLAY SIGN:** The area made available by the sign structure for the purpose of displaying the advertising message.

**ELECTRIC SIGN:** A sign containing electrical wiring, but not including signs illuminated by an exterior light source.

**GROUND SIGN:** A billboard or similar type of sign which is supported by one or more uprights, poles or braces in or upon the ground other than a pole sign, as defined by this code.

**MARQUEE SIGN.** A sign attached to or hung from a marquee projecting from and supported by the building and extending beyond the building wall, building line or street lot line.

**POLE SIGN:** A sign wholly supported by one or more poles in the ground.

**PROJECTING SIGN:** A sign other than a wall sign, which projects from and is supported by a wall of a building or structure.

**ROOF SIGN:** *A sign erected upon or above a roof or parapet of a building or structure.*

**SIGN STRUCTURE:** *Any structure which supports a sign as defined in this code. A sign structure is permitted to be a single pole and is not required to be an integral part of the building.*

**WALL SIGN:** *Any sign attached to or erected against the wall of a building or structure, with the exposed face of the sign in a plane parallel to the plane of the wall.*

**3107.3 Location restrictions.** *Signs shall not be erected in a manner that would confuse or obstruct the view of or interfere with exit signs required by Chapter 10. Signs shall not be erected, constructed so as to obstruct any fire escape or any window or door or opening used as a means of egress. Signs shall not be attached to fire escapes, nor shall they be placed in such a manner as to interfere with any opening required for ventilation.*

**3107.4 Identification.** *Every outdoor sign shall be plainly marked with the name of the person, firm or corporation erecting and maintaining the sign.*

**3107.5 Structural requirements.** *Signs shall be constructed to comply with the structural requirements of this section.*

**3107.5.1 Structural loads.** *Signs shall be designed and constructed to withstand all structural loads as provided for in Chapter 16.*

**3107.5.2 Working stresses.** *The allowable working stresses for signs shall conform with the requirements of Chapter 16. The working stresses of supports and their fastenings shall not exceed 25 per cent of their ultimate strength.*

**Exceptions:**

1. *The allowable working stresses for steel and wood shall be in accordance with the provisions of Chapter 22 and Chapter 23.*
2. *The working strength of chains, cables, wire ropes, steel rods and similar products shall not exceed one-fifth of their ultimate strength.*

**3107.5.3 Attachment.** *Signs shall be securely fastened to supporting structures with anchors, bolts, expansion screws or other approved devices to safely support the loads applied.*

**3107.6 Electrical Illumination.** *A sign shall not be illuminated by other than electrical means, and electrical devices and wiring shall be installed in accordance with the requirements of Chapter 27. Any open spark or flame shall not be used for display purposes unless approved by the building official.*

**3107.6.1 Internally illuminated signs.** *Except as provided for in sections 402.16 and 2611, where internally illuminated signs have sign facings of wood or approved plastic, the area of such facing section shall not be more than 120 ft.<sup>2</sup> (11.16 m<sup>2</sup>) and the wiring for electric lighting shall be entirely enclosed in the sign cabinet with a clearance of not less than 2 inches (51 mm) from the facing material.*

**Exception:** *The dimensional limitation of 120 ft.<sup>2</sup> (11.16 m<sup>2</sup>) shall not apply to sign facing sections made from flame resistant-coated fabric (ordinarily known as “flexible sign face plastic”) that weighs less than 20 oz./yd.<sup>2</sup> (678 g/m<sup>2</sup>) and which, when tested in accordance with NFPA 701, meets the fire propagation performance requirements of both Test 1 and 2 or that when tested in accordance with an approved test method, exhibits an average burn time of 2 seconds or less and a burning extent of 5.9 inches (150 mm) or less for 10 specimens.*

**3107.6.2 Electrical service.** *Signs that require electrical service shall comply with the requirements of Chapter 27.*

**3107.7 Combustible materials.** *Wood, approved plastic or plastic veneer panels as provided for in Chapter 26, or other materials of combustible characteristics similar to wood, used for moldings, copings, nailing blocks, letters, latticing and similar features shall comply with section 3107.9, and shall not be used for other ornamental features of signs unless approved by the building official.*

**3107.7.1 Plastic materials.** *Notwithstanding any other provisions of this code, plastic materials which burn at a rate no faster than 2.5 inches per minute (64 mm/s) when tested in accordance with ASTM D 635 shall be deemed approved plastics and may be used as the display surface material and for the letters, decorations and facings on signs and outdoor display structures.*

**3107.7.2 Electric sign faces.** *Individual plastic facings of electric signs shall not exceed 200 square feet (18.6 m<sup>2</sup>) in area.*

**3107.7.3 Area limitation.** *If the display surface exceeds 200 ft.<sup>2</sup> (18.6 m<sup>2</sup>), the area occupied or covered by approved plastics shall be limited to 200 ft.<sup>2</sup> (18.6 m<sup>2</sup>) plus 50 per cent of the difference between 200 ft.<sup>2</sup> (18.6 m<sup>2</sup>) and the area of display surface. The area of plastic on a display surface shall not in any case exceed 1,100 ft.<sup>2</sup> (102 m<sup>2</sup>).*

**3107.7.4 Plastic appurtenances.** *Letters and decorations mounted on an approved plastic facing or display surface may consist of approved plastics.*

**3107.8 Animated devices.** *Signs that contain moving sections or ornaments shall have fail-safe provisions to prevent the section or ornament from releasing and falling. The fail-safe device shall be in addition to the mechanism that operates the movable section or ornament. The fail-safe device shall be capable of supporting the full dead load of the section or ornament when the moving mechanism releases.*

**3107.9 Ground signs.** *The structural frame of ground signs shall not be erected of combustible materials to a height of more than 35 feet (10668 mm) above the ground. Ground signs constructed entirely of noncombustible material shall not be erected to a height of greater than 100 feet (30 480 mm) above the ground unless approved by the building official.*

**3107.9.1 Wood anchors and supports.** *Where wood anchors or supports are embedded in the soil, the wood shall be pressure treated with an approved preservative.*

**3107.10 Roof signs.** *Roof signs which have an area exceeding 40 ft.<sup>2</sup> (3.72 m<sup>2</sup>) shall be constructed entirely of metal or other approved noncombustible material. Provisions shall be made for electric grounding of metallic parts. Where combustible materials are permitted in letters or other ornamental features, wiring and tubing shall be kept free and insulated therefrom. Roof signs shall be so constructed as to leave a clear space of not less than 6 feet (1,829 mm) between the roof level and the lowest part of the sign and shall have at least 5 feet (1,524 mm) clearance between the vertical supports thereof. No portion of a roof sign structure shall project beyond an exterior wall unless it also complies with the requirements for projecting signs.*

**3107.10.1 Bearing.** *The bearing components of roof signs shall distribute the load directly upon the supporting structure for the building. The building shall be designed to resist the loads imposed by roof signs. All signs shall be securely fastened to the building upon which they are installed to safely support the loads applied.*

**3107.10.2 Height of open signs.** *Open roof signs in which the uniform open area is not less than 40 per cent of total gross area shall not exceed a height of 75 feet (22 860 mm) on buildings of Type I or Type II construction. On buildings of other construction types, the height shall not exceed 40 feet (12, 192 mm).*

**3107.10.3 Height of closed signs.** *A closed roof sign shall not be erected to a height greater than 50 feet (15 240 mm) above the roof of buildings of Types I and II construction, nor more than 35 feet (10 668 mm) above the roof of buildings of Types III, IV and V construction.*

**3107.11 Wall signs.** *Wall signs which have an area exceeding 40 ft.<sup>2</sup> (3.72 m<sup>2</sup>) shall be constructed of metal or other approved noncombustible material.*

**3107.11.1 Exterior wall mounting details.** *Wall signs shall be securely attached to exterior walls to safely support the loads applied. A wall sign shall not be supported by anchorages secured to an unbraced parapet wall.*

**3107.11.2 Extension.** *Wall signs shall not extend above the top of the wall, nor extend beyond the walls to which the signs are attached unless such signs conform to the requirements for roof signs, projecting signs or ground signs.*

**3107.12 Projecting signs.** *Projecting signs which have an area exceeding 40 ft.<sup>2</sup> (3.72 m<sup>2</sup>) shall be constructed entirely of metal or other noncombustible material and be securely attached to the building or structure with supports in a manner that safely supports the loads applied. Projecting signs not parallel to the building or structure shall be supported with approved means. Such signs shall be designed and erected to resist the structural loads specified in Chapter 16.*

**3107.12.1 Attachment of supports.** *Supports shall be securely anchored to the building or structure with bolts, expansion screws or other approved means.*

**3107.12.2 Wall mounting details.** *Supports used for projecting signs are permitted to be fastened to exterior walls with expansion bolts, machine screws or other approved means, but such supports shall not be attached to unbraced parapet walls.*

**3107.12.3 Height limitation.** *A projecting sign shall not be erected on the wall of any building so as to project above the top of the wall.*

**Exception:** *A sign erected perpendicular to the building wall having a horizontal width not exceeding 18 inches (457 mm) is permitted to be erected to a height not exceeding 2 feet (610 mm) above the top of the wall unless approved by the building official. A sign attached to a corner of a building and parallel to the vertical line of such corner shall be deemed to be erected at a right angle to the building wall.*

**3107.12.4 Additional loads.** *Projecting sign structures which may be used to support an individual on a ladder or other service equipment, whether or not specifically designed for the service equipment, shall be capable of supporting the anticipated load, but it shall not be less than a 100 pound (445 N) concentrated horizontal load and a 300 pound (1,334 N) concentrated vertical load applied at the point of most eccentric loading. The building component to which the projecting sign is attached shall also be designed to support the additional loads.*

**3107.13 Marquee signs.** *Marquee signs which have an area exceeding 40 ft.<sup>2</sup> (3.72 m<sup>2</sup>) shall be constructed entirely of metal or other approved noncombustible material.*

**3107.13.1 Attachment.** *Marquee signs shall be attached to approved marquees that are constructed in accordance with section 3106.*

**3107.13.2 Dimensions.** *Marquee signs, whether on the front or side of the marquee, shall not project beyond the perimeter of the marquee.*

**3107.13.3 Height limitation.** *Marquee signs shall not extend more than 6 feet (1829 mm) above, nor more than 1 foot (305 mm) below the marquee unless approved by the building official. Marquee signs have a vertical dimension not greater than 8 feet (2,438 mm) unless approved by the building official.*

**3107.14 Combination signs.** *Combination signs shall conform to the requirements for pole, projecting and roof signs to the extent such features are incorporated from each type.*

## **SECTION 3108 TELECOMMUNICATION AND BROADCAST TOWERS**

**3108.1 General.** Towers shall be designed and constructed in accordance with the provisions of TIA-222.

**Exception:** Single free-standing poles used to support antennas not greater than 75 feet (22, 860 mm), measured from the top of the pole to grade, shall not be required to be noncombustible.

**3108.2 Location and access.** Towers shall be located such that guy wires and other accessories shall not cross or encroach upon any street or other public space, or over above-ground electric utility lines, or encroach upon any privately owned property without the written consent of the owner of the encroached-upon property, space or above-ground electric utility lines. Towers shall be equipped with climbing and working facilities in compliance with TIA-222. Access to the tower sites shall be limited as required by applicable OSHA, FCC and EPA regulations.

## **SECTION 3109 SWIMMING POOL ENCLOSURES AND SAFETY DEVICES**

**3109.1 General.** Swimming pools and all appurtenant structures, installations and equipment shall comply with the requirements of this section and other applicable sections of this code and the Ohio department of health rules pertaining to swimming pools and their service equipment (Chapter 3701-31 of the Administrative Code, pursuant to Chapter 3749. of the Revised Code). Private residential swimming pools are not regulated by this code. Swimming pool facilities shall be accessible in accordance with ICC A117.1 to the extent required in Chapter 11.

**3109.1.1 Plan approval.** A public swimming pool or appurtenances thereto shall not be constructed, installed, enlarged or altered until plans for those elements subject to this code have been submitted and approval has been obtained from the code official. All public swimming pools are required to have approval by the Ohio department of health in accordance with section 3749.03 of the Revised Code prior to application for plan approval. Copies of

these approvals shall be obtained by the applicant and submitted as part of the supporting data for the plan approval application.

**3109.1.2 Plans.** Plans shall accurately show dimensions and construction of the pool and appurtenances and properly established distances to lot lines, buildings, walks and fences, as well as details of the water supply system, drainage and water disposal systems, and all appurtenances pertaining to the swimming pool. Detailed plans of structures, vertical elevations and sections through the pool showing depth shall be included.

**3109.2 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.

**PRIVATE RESIDENTIAL SWIMMING POOL.** Any indoor or outdoor structure, chamber, or tank containing a body of water for swimming, diving or bathing intended to serve a residential structure containing not more than 3 dwelling units and used exclusively by the residents and their nonpaying guests. Any swimming pool other than a private residential swimming pool shall be classified as a public swimming pool.

**PUBLIC SWIMMING POOL.** Any indoor or outdoor structure, chamber, or tank containing a body of water for swimming, diving, or bathing that is intended to be used collectively for swimming, diving, or bathing and is operated by any person whether as the owner, lessee, operator, licensee, or concessionaire, regardless of whether or not a fee is charged for use, but does not mean any public bathing area, private residential swimming pool or any structure, chamber and tank that is easily portable when empty with a capacity of no more than 150 gallons.

**RESIDENTIAL SWIMMING POOL.** Any indoor or outdoor swimming pool meeting the definition of a public swimming pool and intended to serve a residential structure containing more than 3 dwelling units and used exclusively by the residents and their nonpaying guests.

**3109.3 Public swimming pool enclosures.** Public swimming pools shall be completely enclosed by a fence or similar barrier at least 4 feet (1,290 mm) in height or a screen enclosure. Openings in the fence shall not permit the passage of a 4-inch-diameter (102 mm) sphere. The fence or screen enclosure shall be equipped with self-closing and self-latching gates. Gates provided and functioning as an element of a building's required means of egress shall comply with the requirements of 1008.2.

**3109.4 Residential swimming pool enclosures.** Residential swimming pools shall comply with Sections 3109.4.1 through 3109.4.3.

**Exception:** A swimming pool with a power safety cover or a spa with a safety cover complying with ASTM F 1346.

**3109.4.1 Barrier height and clearances.** The top of the barrier shall be at least 48 inches (1,219 mm) above grade measured on the side of the barrier that 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 that faces away from the swimming pool. Where the top of the pool structure is above grade, the barrier is authorized to be at ground level or mounted on top of the pool structure, and the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm).

**3109.4.1.1 Openings.** Openings in the barrier shall not allow passage of a 4-inch-diameter (102 mm) sphere.

**3109.4.1.2 Solid barrier surfaces.** Solid barriers which do not have openings shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.

**3109.4.1.3 Closely spaced horizontal members.** 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 (1,143 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.

**3109.4.1.4 Widely spaced horizontal members.** Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1,143 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.

**3109.4.1.5 Chain link dimensions.** Maximum mesh size for chain link fences shall be a 2¼ inch square (57 mm square) unless the fence is

provided with slats fastened at the top or the bottom which reduce the openings to no more than 1¾ inches (44 mm).

**3109.4.1.6 Diagonal members.** 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).

**3109.4.1.7 Gates.** Access doors or gates shall comply with the requirements of Sections 3109.4.1.1 through 3109.4.1.6 and shall be equipped to accommodate a locking device. Pedestrian access doors or gates shall open outward away from the pool and shall be self-closing and have a self-latching device. Doors or gates other than pedestrian access doors or gates shall have a self-latching device. Release mechanisms shall be in accordance with Sections 1008.1.9 and 1109.12. Where the release mechanism of the self-latching device is located less than 54 inches (1,372 mm) *above the finished surface*, the release mechanism shall be located on the pool side of the door or gate at least 3 inches (76 mm) below the top of the door or gate, and the door or gate and barrier shall have no opening greater than ½ inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.

**3109.4.1.8 Dwelling wall as a barrier.** Where a wall of a dwelling serves as part of the barrier, one of the following shall apply:

1. Doors with direct access to the pool through that wall shall be equipped with an alarm that produces an audible warning when the door and/or its screen, if present, are opened. The alarm shall be listed and labeled in accordance with UL 2017. In dwellings not required to be Accessible units, Type A units or Type B units, the deactivation switch shall be located 54 inches (1,372 mm) or more above the threshold of the door. In dwellings required to be Accessible units, Type A units or Type B units, the deactivation switch(es) shall be located at 54 inches (1,372 mm) maximum and 48 inches (1,219 mm) minimum above the threshold of the door.
2. The pool shall be equipped with a power safety cover that complies with ASTM F 1346.
3. Other means of protection, such as self-closing doors with self-latching devices, which are approved, shall be accepted so long as the degree of protection is not less than the protection *required* by Section 3109.4.1.8, Item 1 or 2.

**3109.4.1.9 Pool structure as barrier.** 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, then 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 3109.4.1.1 through 3109.4.1.8. 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.

**3109.4.2 Indoor swimming pools.** Walls surrounding indoor swimming pools shall not be required to comply with Section 3109.4.1.8.

**3109.4.3 Prohibited locations.** Barriers shall be located so as to prohibit permanent structures, equipment or similar objects from being used to climb the barriers.

**3109.5 Entrapment avoidance.** Suction outlets shall be designed and installed in accordance with ANSI/APSP-7 and applicable Ohio Department of health rules pertaining to swimming pools and their service equipment (Chapter 3701-31 of the Administrative Code).

**3109.6 Structural design.** Pools and towers or slide structures shall be engineered and designed to withstand the expected forces to which those structures will be subjected.

**3109.6.1 Access to accessory structures.** Stairs for towers, platforms, slides and similar structures exceeding 3 meters in height shall be designed and constructed in accordance with the applicable requirements of section 1009. Ladders or stairs conforming with the manufacturer's recommended installation instructions shall be provided for structures 3 meters or less in height.

**3109.7 Water supply.** Water supply and cross connection control shall be in accordance with rules of the Ohio department of health.

**3109.7.1 Drainage systems.** Deck drainage shall be directed to a storm water system or otherwise disposed of in an approved manner. Decks for indoor pools shall be provided with separate deck drainage unless specifically exempted by the Ohio department of health.

**3109.8 Appurtenant structures.** All appurtenant structures, installations and equipment, such as showers, slide structures, dressing rooms, equipment houses,

or other buildings and structures, including plumbing, heating and air conditioning systems, shall comply with all applicable requirements of this code.

**3109.8.1 Accessories.** All swimming pool accessories shall be designed, constructed and installed so as not to be a safety hazard. Installations or structures for diving purposes shall be properly anchored to insure stability.

**3109.9 Equipment installations.** Pumps, filters and other mechanical and electrical equipment for public swimming pools shall be enclosed in such a manner as to be accessible only to authorized persons and not to bathers. Construction and drainage shall be arranged to avoid the entrance and accumulation of water in the vicinity of electrical equipment.

## **SECTION 3110 AUTOMATIC VEHICULAR GATES**

**3110.1 General.** Automatic vehicular gates shall comply with the requirements of this section and other applicable sections of this code.

**3110.2 Definitions.** The following word and term shall, for the purposes of this section and as used elsewhere in this code, have the meaning shown herein.

**VEHICULAR GATE.** A gate that is intended for use at a vehicular entrance or exit to a facility, building or portion thereof, and that is not intended for use by pedestrian traffic.

**3110.3 Vehicular gates intended for automation.** Vehicular gates intended for automation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200.

**3110.4 Vehicular gate openers.** Vehicular gate openers, when provided, shall be listed in accordance with UL 325.

## **SECTION 3111 MANUFACTURED HOMES AND MOBILE UNITS**

**3111.1 General.** Manufactured homes constructed under 24 CFR part 3280, "Manufactured Home Construction and Safety Standards" used for single-family dwellings are not regulated by this code. The federal standards shall be the exclusive construction and safety standards in this state and neither the state nor

any political subdivision of the state may establish any other standard governing the construction of manufactured homes.

Mobile units used for temporary occupancy for travel, recreation or vacation purposes are not regulated by this code.

All similar mobile units used for any other purpose are regulated by this code and shall be classified with respect to use in one of the applicable groups.

The installation of manufactured homes is regulated by the rules of the Ohio manufactured homes commission pursuant to section 4781 of the Revised Code.

**3111.2 Manufactured home parks.** See applicable Ohio manufactured homes commission or Ohio department of health rules for licensing and other manufactured home park regulations.

## **SECTION 3112** **REFUSE CONTAINERS**

**3112.1 General.** Pursuant to sections 3791.21 and 3791.99 of the Revised Code, this section prescribes the safety standards for refuse containers which are self-dumping by means of a specially designed front, side or rear loading vehicle.

**3112.2 Purpose.** The purpose of prescribing safety standards for the manufacture, construction, installation, or redesign of refuse containers is to ensure that they will not tip over if persons climb in or on the refuse container.

**3112.3 Standards.** All newly manufactured or installed refuse containers and all existing refuse containers, as described in Section 3112.1, shall be tested and comply with the testing conditions and procedures of the “Consumer Product Safety Act Regulations, 16 C.F.R. 1301.”

**3112.4 Enforcement.** The jurisdiction may adopt ordinances to provide for the enforcement of the provisions of Section 3112.3.

Replaces: 4101:1-31-01, 4101:2-88-01, 4101:2-88-02,  
4101:2-88-03, 4101:2-88-04

Effective: 03/01/2013

R.C. 119.032 review dates: 11/01/2016

CERTIFIED ELECTRONICALLY

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Certification

02/08/2013

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Date

Promulgated Under: 119.03  
Statutory Authority: 3781.10(A), 3791.21  
Rule Amplifies: 3781.10, 3781.11, 3791.04, 3791.21, 3791.99  
Prior Effective Dates: 11/1/78, 7/1/79, 7/1/82, 3/1/85, 8/1/86, 1/1/89, 9/1/92,  
2/1/93, 7/5/93, 7/1/95, 2/1/96, 3/1/98, 10/1/99, 1/1/02,  
7/1/02, 3/1/05, 7/1/07, 11/1/11

**4101:1-35-01 Referenced standards.**

**3501.1 General.** *This chapter lists the standards that are referenced in various sections of the building code. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title. The application of the referenced standards shall be as specified in Section 102.5.*

**3501.2 Referenced codes.** *When indicated in this code, the following codes refer to provisions in the listed chapters of the administrative code:*

<i>Referenced Code</i>	<i>Ohio Administrative Code Chapters</i>
<i>Building Code</i>	<i>4101:1-1 to 4101:1-35</i>
<i>Energy Code</i>	<i>4101:1-13</i>
<i>Fire Code</i>	<i>1301:7-1 to 1301:7-7</i>
<i>Mechanical Code</i>	<i>4101:2-1 to 4101:2-15</i>
<i>Ohio Boiler and Pressure Vessel Rules</i>	<i>4101:4-1 to 4101:4-10</i>
<i>Ohio Elevator Code</i>	<i>4101:5-1 to 4101:5-3</i>
<i>Residential Code of Ohio for One, Two and Three Family Dwellings</i>	<i>4101:8-1 to 4101:8-44</i>
<i>Plumbing Code</i>	<i>4101:3-1 to 4101:3-13 (These rules apply to all buildings other than one, two, and three family dwellings)</i>
<i>Plumbing Code, Ohio (as referenced in the Residential Code of Ohio)</i>	<i>4101:3-1 to 4101:3-13, codified and published as the 2007 Ohio Plumbing Code, effective 7-1-2007 (including updates) through 11-1-2011 (These rules apply only to one, two, and three family dwellings)</i>

**3501.3 Building Code Referenced Standards.**

Aluminum Association

1525 Wilson Boulevard, Suite 600  
Arlington, VA 22209

## **AA**

### **Standard reference number**

### **Title**

ADM1—10

Aluminum Design Manual: Part 1-A Specification for Aluminum Structures, Allowable Stress Design; and Part 1-B—Aluminum Structures, Load and Resistance Factor Design

ASM 35—00

Aluminum Sheet Metal Work in Building Construction (Fourth Edition)

American Architectural Manufacturers Association  
1827 Waldon Office  
Square, Suite 550  
Schaumburg, IL 60173

## **AAMA**

### **Standard reference number**

### **Title**

1402—09

Standard Specifications for Aluminum Siding, Soffit and Fascia

AAMA/WDMA/CSA  
101/I.S.2/A440—08

North American Fenestration  
Standard/Specifications for Windows, Doors and  
Skylights

American Concrete Institute  
38800 Country Club Drive  
Farmington Hills, MI 48331

## **ACI**

### **Standard reference number**

### **Title**

216.1—07

Standard Method for Determining Fire Resistance of Concrete and Masonry Construction Assemblies

318—08

Building Code Requirements for Structural Concrete

530—08 Building Code Requirements for Masonry Structures  
 530.1—08 Specifications for Masonry Structures

American Forest & Paper Association  
 1111 19th St, NW Suite 800  
 Washington, DC 20036

**AF&PA  
 Standard  
 reference  
 number**

**Title**

WCD No. 4—03

Wood Construction Data—Plank and Beam  
 Framing for Residential

NDS—05

National Design Specification (NDS) for  
 Wood Construction with 2005 Supplement  
 Span Tables for Joists and Rafters

AF&PA—93

ANSI/AF&PA PWF—07

Permanent Wood Foundation Design  
 Specification

ANSI/AF&PA SDPWS—08

Special Design Provisions for Wind and  
 Seismic

American Institute of Steel Construction  
 One East Wacker Drive, Suite 3100  
 Chicago, IL 60601-2001

**AISC  
 Standard  
 reference  
 number**

**Title**

341—05

Seismic Provisions for Structural Steel Buildings, including  
 Supplement No. 1 dated 2005

360—05

Specification for Structural Steel Buildings

American Iron and Steel Institute  
 1140 Connecticut Avenue  
 Suite 705  
 Washington, DC 20036

**AISI  
 Standard  
 reference**

<b>number</b>	<b>Title</b>
S100—07	North American Specification for the Design of Cold-formed Steel Structural Members
S200—08	North American Standard for Cold-formed Steel Framing—General
S210—08	North American Standard for Cold-formed Steel Framing—Floor and Roof System Design
S211—08	North American Standard for Cold-formed Steel Framing—Wall Stud
S212—08	North American Standard for Cold-formed Steel Framing—Header Design
S213—08	North American Standard for Cold-formed Steel Framing—Lateral Design
S214—08	North American Standard for Cold-formed Steel Framing—Truss Design, with Supplement 2, dated 2008

American Institute of Timber Construction  
 Suite 140  
 7012 S. Revere Parkway  
 Englewood, CO 80112

**AITC  
 Standard  
 reference**

<b>number</b>	<b>Title</b>
AITC Technical Note 7—96	Calculation of Fire Resistance of Glued Laminated Timbers
AITC 104—03	Typical Construction Details
AITC 110—01	Standard Appearance Grades for Structural Glued Laminated
AITC 113—01	Standard for Dimensions of Structural Glued Laminated Timber
AITC 117—04	Standard Specifications for Structural Glued Laminated Timber of Softwood Species
AITC 119—96	Standard Specifications for Structural Glued Laminated Timber of Hardwood
AITC200—09	Manufacturing Quality Control Systems Manual for Structural Glued Laminated Timber
ANSI/AITCA 190.1—07	Structural Glued Laminated Timber

Automotive Lift Institute  
 P.O. Box 85  
 Courtland, NY 13045

**ALI  
 Standard  
 reference  
 number**

**Title**

ALI ALCTV—2007

Standard for Automobile Lifts—Safety  
 Requirements for Construction, Testing and  
 Validation (ANSI)

American National Standards Institute  
 25 West 43rd Street, Fourth Floor  
 New York, NY 10036

**ANSI  
 Standard  
 reference  
 number**

**Title**

A13.1—07

Scheme for the Identification of Piping Systems

A108.1A—09

Installation of Ceramic Tile in the Wet-set Method, with  
 Portland Cement

A108.1B—09

Installation of Ceramic Tile, quarry Tile on a Cured  
 Portland Cement Mortar Setting Bed with Dry-set or Latex-  
 Installation of Ceramic Tile with Organic Adhesives or  
 Water-cleanable Tile-setting Epoxy Adhesive

A108.4—09

A108.5—09

Installation of Ceramic Tile with Dry-set Portland Cement  
 Mortar or Latex-portland Cement Mortar

A108.6—09

Installation of Ceramic Tile with Chemical-resistant, Water  
 Cleanable Tile-setting and -grouting Epoxy

A108.8—09

Installation of Ceramic Tile with Chemical-resistant Furan  
 Resin Mortar and Grout

A108.9—09

Installation of Ceramic Tile with Modified Epoxy  
 Emulsion Mortar/Grout

A108.10—09

Installation of Grout in Tilework

A118.1—10.1

American National Standard Specifications for Dry-set  
 Portland Cement

A118.3—10.1

American National Standard Specifications for Chemical-  
 resistant, Water-cleanable Tile-setting and -grouting Epoxy  
 and Water Cleanable Tile-setting Epoxy

A118.4—10.1	American National Standard Specifications for Latex-portland Cement
A118.5—10.1	American National Standard Specifications for Chemical Resistant Furan Mortar and Grouts for Tile
A118.8—10.1	American National Standard Specifications for Modified Epoxy Emulsion Mortar/Grout
A136.1—10.1	American National Standard Specifications for Organic Adhesives for Installation of Ceramic
137.1—08	American National Standard Specifications for Ceramic Tile
A208.1—09	Particleboard
Z 97.1—09	Safety Glazing Materials Used in Buildings—Safety Performance Specifications and Methods of Test

APA - Engineered Wood Association  
7011 South 19th  
Tacoma, WA 98466

**APA  
Standard  
reference  
number**

**Title**

APA PDS—08	Panel Design Specification
APA PDS Supplement 1—90	Design and Fabrication of Plywood Curved Panels (revised 1995)
APA PDS Supplement 2—92	Design and Fabrication of Plywood-lumber Beams (revised 1998)
APA PDS Supplement 3—96	Design and Fabrication of Plywood Stressed-skin Panels (revised 1996)
APA PDS Supplement 4—93	Design and Fabrication of Plywood Sandwich Panels (revised 1993)
APA PDS Supplement 5—95	Design and Fabrication of All-plywood Beams (revised 1995)
EWS R540—07	Builders Tips: Proper Storage and Handling of Glulam Beams
EWS S475—07	Glued Laminated Beam Design Tables

EWS S560—10	Field Notching and Drilling of Glued Laminated Timber Beams
EWS T300—07	Glulam Connection
EWS X440—08	Product Guide— Glulam
EWS X450—01	Glulam in Residential Construction—Western Edition

The Association of Pool & Spa Professionals  
2111 Eisenhower Avenue  
Alexandria, VA 22314

**APSP**  
**Standard**  
**reference**  
**number**

**Title**

ANSI/APSP 7—06	Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs and Catch Basins
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American Society of Agricultural and Biological Engineers  
2950 Niles Road  
St. Joseph, MI 49085

**ASABE**  
**Standard**  
**reference**  
**number**

**Title**

EP 484.2 -98	Diaphragm Design of Metal-clad, Post-frame Rectangular Buildings
EP 486.1 -99	Shallow-post Foundation Design
EP 559 -03	Design Requirements and Bending Properties for Mechanically Laminated Columns

American Society of Civil Engineers  
Structural Engineering Institute  
1801 Alexander Bell Drive  
Reston, VA 20191-4400

**ASCE/SEI**  
**Standard**  
**reference**  
**number**

**Title**

3—91	Structural Design of Composite Slabs
5—08	Building Code Requirements for Masonry
6—08	Specification for Masonry Structures
7—05	Minimum Design Loads for Buildings and Other Structures including Supplements No. 1 and 2, excluding Chapter 14 and Appendix 11A
8—02	Standard Specification for the Design of Cold-formed Stainless Steel Structural Members
19—10	Structural Applications of Steel Cables for Buildings
24—05	Flood Resistant Design and Construction
29—05	Standard Calculation Methods for Structural Fire Protection
32—01	Design and Construction of Frost Protected Shallow Foundations

*American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.*  
 1791 Tullie Circle, NE  
 Atlanta, GA 30329-2305

### **ASHRAE**

#### **Standard**

#### **Reference**

#### **Number**

#### **Title**

ASHRAE 90.1-2007 *Energy Standard for Buildings Except Low-Rise Buildings*

American Society of Mechanical Engineers

Three Park Avenue

New York, NY 10016-5990

### **ASME**

#### **Standard**

#### **reference**

#### **number**

#### **Title**

A17.1/CSA B44—2010

Safety Code for Elevators and Escalators

A18.1—2008

Safety Standard for Platform Lifts and Stairway Chairlifts

A90.1—2009

Safety Standard for Belt Manlifts

B16.18—2001

(Reaffirmed 2005)

Cast Copper Alloy Solder Joint Pressure Fittings

B16.22—2001

(Reaffirmed 2005)

Wrought Copper and Copper Alloy Solder Joint Pressure Fittings

B20.1—2009 Safety Standard for Conveyors and Related Equipment  
 B31.3—2008 Process Piping

ASTM International  
 100 Barr Harbor Drive  
 West Conshohocken, PA 19428-2959

**ASTM  
 Standard  
 reference  
 number**

**Title**

A 36/A 36M—08	Specification for Carbon Structural Steel
A 153/A 153M—09	Specification for Zinc Coating (Hot-dip) on Iron and Steel Hardware
A 240/A 240M—10a	Standard Specification for Chromium and Chromium-nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications
A 252—10	Specification for Welded and Seamless Steel Pipe Piles
A 283/A 283M—03(2007)	Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
A 307—07b	Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
A 416/A 416M—10	Specification for Steel Strand, Uncoated Seven-wire for Prestressed Concrete
A 463/A 463M—09a	Standard Specification for Steel Sheet, Aluminum-coated, by the Hot-dip Process
A 572/A 572M—07	Specification for High-strength Low-alloy Columbium-vanadium Structural Steel
A 588/A 588M—10	Specification for High-strength Low-alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4 inches (100 mm) Thick
A 615/A 615M—09b	Specification for Deformed and Plain Billet-steel Bars for Concrete Reinforcement
A 653/A 653M—09a	Specification for Steel Sheet, Zinc-coated Galvanized or Zinc-iron Alloy-coated Galvannealed by the Hot-dip Process
A 690/A 690M—07	Standard Specification for High-strength Low-alloy Nickel, Copper, Phosphorus Steel H-piles and

A 706/A 706M—09b	Sheet Piling with Atmospheric Corrosion Resistance for Use in Marine Environments Specification for Low-alloy Steel Deformed and Plain Bars for Concrete Reinforcement
A 722/A 722M—07	Specification for Uncoated High-strength Steel Bar for Prestressing
A 755/A 755M—03(2008)	Specification for Steel Sheet, Metallic-coated by the Hot-dip Process and Prepainted by the Coil-coating Process for Exterior Exposed Building Products
A 792/A 792M—09a	Specification for Steel Sheet, 55% Aluminum-zinc Alloy-coated by the Hot-dip Process
A 875/A 875M—09a	Standard Specification for Steel Sheet Zinc-5 percent, Aluminum Alloy-coated by the Hot-dip Process
A 913/A 913M—07	Specification for High-strength Low-alloy Steel Shapes of Structural Quality, Produced by Quenching and Self-tempering Process (QST)
A 924/A 924M—10	Standard Specification for General Requirements for Steel Sheet, Metallic-coated by the Hot-dip Process
A 992/A 992M—06a	Standard Specification for Structural Shapes
B 42—10	Specification for Seamless Copper Pipe, Standard
B 43—09	Specification for Seamless Red Brass Pipe, Standard Sizes
B 68—02	Specification for Seamless Copper Tube, Bright Annealed (Metric
B 88—09	Specification for Seamless Copper Water Tube
B 101—07	Specification for Lead-coated Copper Sheet and Strip for Building Construction
B 209—07	Specification for Aluminum and Aluminum Alloy Steel and Plate
B 251—10	Specification for General Requirements for Wrought Seamless Copper and Copper-alloy Tube
B 280—08	Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service
B 370—09	Specification for Cold-rolled Copper Sheet and Strip for Building Construction
B 695—04(2009)	Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel

C 5—10	Specification for Quicklime for Structural
C 22/C 22M—00 (2005)e01	Specification for Gypsum
C 27—98 (2008)	Specification for Standard Classification of Fireclay and High-alumina Refractory Brick
C 28/C 28M—10	Specification for Gypsum
C 31/C 31M—10	Practice for Making and Curing Concrete Test Specimens in the Field
C 33—08	Specification for Concrete Aggregates
C 34—10	Specification for Structural Clay Load-bearing Wall Tile
C 35—01(2009)	Specification for Inorganic Aggregates for Use in Gypsum Plaster
C 36/C 36M—03	Specification for Gypsum Wallboard
C 37/C 37M—01	Specification for Gypsum Lath
C 55—09	Specification for Concrete Building Brick
C 56—10	Specification for Structural Clay Nonloadbearing Tile
C 59/C 59M—00 (2006)	Specification for Gypsum Casting and Molding Plaster
C 61/C 61M—00 (2006)	Specification for Gypsum Keene's
C 62—10	Specification for Building Brick (Solid Masonry Units Made from Clay or Shale)
C 67—09	Test Methods of Sampling and Testing Brick and Structural Clay
C 73—05	Specification for Calcium Silicate Face Brick (Sand-lime Brick)
C 79—04a	Specification for Treated Core and Nontreated Core Gypsum Sheathing Board
C 90—09	Specification for Loadbearing Concrete Masonry Units
C 91—05	Specification for Masonry Cement
C 94/C 94M—10	Specification for Ready-mixed
C 126—10	Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick and Solid Masonry Units
C 140—10	Test Method Sampling and Testing Concrete Masonry Units and Related Units
C 150—09	Specification for Portland Cement
C 172—10	Practice for Sampling Freshly Mixed
C 199—84 (2005)	Test Method for Pier Test for Refractory Mortars
C 206—03 (2009)	Specification for Finishing Hydrated Lime
C 208—08a	Specification for Cellulosic Fiber Insulating Board

C 212—10	Specification for Structural Clay Facing Tile
C 216—10	Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)
C 270—10	Specification for Mortar for Unit Masonry
C 315—07	Specification for Clay Flue Liners and Chimney Pots
C 317/C 317M—00 (2005)	Specification for Gypsum Concrete
C 330—09	Specification for Lightweight Aggregates for Structural Concrete
C 331—05	Specification for Lightweight Aggregates for Concrete Masonry Units
C 406—10	Specification for Roofing Slate
C 442/C 442M—04	Specification for Gypsum Backing Board and Coreboard and Gypsum Shaftliner Board
C 472—99 (2009)	Specification for Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete
C 473—10	Test Method for Physical Testing of Gypsum Panel Products
C 474—05	Test Methods for Joint Treatment Materials for Gypsum Board Construction
C 475—02 (2007)	Specification for Joint Compound and Joint Tape for Finishing Gypsum Wallboard
C 503—10	Specification for Marble Dimension Stone (Exterior)
C 514—04 (2009)e1	Specification for Nails for the Application of Gypsum
C 516—08	Specifications for Vermiculite Loose Fill Thermal
C 547—07e1	Specification for Mineral Fiber Pipe Insulation
C 549—06	Specification for Perlite Loose Fill
C 552—07	Standard Specification for Cellular Glass Thermal Insulation
C 557—03(2009)e01	Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing
C 568—10	Specification for Limestone Dimension Stone
C 578—10	Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
C 587—04 (2009)	Specification for Gypsum Veneer Plaster
C 588/C 588M—01	Specification for Gypsum Base for Veneer Plasters
C 595—10	Specification for Blended Hydraulic Cements
C 615—10	Specification for Granite Dimension
C 616—10	Specification for Quartz Dimension Stone

C 629—10	Specification for Slate Dimension
C 630/C 630M—03	Specification for Water-resistant Gypsum Backing Board
C 631—09	Specification for Bonding Compounds for Interior Gypsum Plastering
C 635/C 635M-07	Specification for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel
C 636/C 636M—08	Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
C 645—09a	Specification for Nonstructural Steel Framing Members
C 652—10	Specification for Hollow Brick (Hollow Masonry Units Made from Clay or Shale)
C 728—05 (2010)	Standard Specification for Perlite Thermal Insulation Board
C 744—10	Specification for Prefaced Concrete and Calcium Silicate Masonry
C 754—09a	Specification for Installation of Steel Framing Members to Receive Screw-attached Gypsum Panel Products
C 836/C 836M-10	Specification for High-solids Content, Cold Liquid-applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
C 840—08	Specification for Application and Finishing of Gypsum Board
C 841—03 (2008)e1	Specification for Installation of Interior Lathing and Furring
C 842—05	Specification for Application of Interior Gypsum Plaster
C 843—99 (2006)	Specification for Application of Gypsum Veneer Plaster
C 844—10	Specification for Application of Gypsum Base to Receive Gypsum Veneer Plaster
C 847—10a	Specification for Metal Lath
C 887—05 (2010)	Specification for Packaged, Dry Combined Materials for Surface Bonding Mortar
C 897—05 (2009)	Specification for Aggregate for Job-mixed Portland Cement-based Plaster

C 920—10	Standard for Specification for Elastomeric Joint Sealants
C 926—06	Specification for Application of Portland Cement-based Plaster
C 931/C 931M—04	Specification for Exterior Gypsum Soffit Board
C 932—06	Specification for Surface-applied Bonding Compounds Agents for Exterior Plastering
C 933—09	Specification for Welded Wire Lath
C 946—10	Specification for Practice for Construction of Dry-stacked, Surface-bonded Walls
C 954—10	Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 inch (0.84 mm) to 0.112 inch (2.84 mm) in Thickness
C 955—09a	Standard Specification for Load-bearing Transverse and Axial Steel Studs, Runners Tracks, and Bracing or Bridging, for Screw Application of Gypsum Panel Products and Metal Plaster Bases
C 956—04 (2010)	Specification for Installation of Cast-in-place Reinforced Gypsum
C 957—10	Specification for High-solids Content, Cold Liquid-applied Elastomeric Waterproofing Membrane with Integral Wearing Surface
C 960—04	Specification for Predecorated Gypsum Board
C 1002—07	Specification for Steel Self-piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
C 1007—08a	Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories
C 1019—09	Test Method of Sampling and Testing Grout
C 1029—10	Specification for Spray-applied Rigid Cellular Polyurethane Thermal Insulation
C 1032—06	Specification for Woven Wire Plaster Base
C 1047—10a	Specification for Accessories for Gypsum Wallboard and Gypsum Veneer
C 1063—08	Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-based Plaster

C 1088—10	Specification for Thin Veneer Brick Units Made from Clay or Shale
C 1167—03 (2009)	Specification for Clay Roof Tiles
C 1177/C 1177M—08	Specification for Glass Mat Gypsum Substrate for Use as Sheathing
C 1178/C 1178M—08	Specification for Coated Glass Mat Water-resistant Gypsum Backing Panel
C 1186—08	Specification for Flat-Fiber Cement Sheets
C 1261—10	Specification for Firebox Brick for Residential Fireplaces
C 1278/C 1278M—07a	Specification for Fiber-reinforced Gypsum Panels
C 1280—09	Specification for Application of Gypsum Sheathing
C 1283—07a	Practice for Installing Clay Flue Lining.
C 1288—99 (2010)	Standard Specification for Discrete Nonasbestos Fiber-cement Interior Substrate Sheets
C 1289—10	Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
C 1314—10	Test Method for Compressive Strength of Masonry Prisms
C 1325—08b	Standard Specification for Nonasbestos Fiber-mat Reinforced Cement Interior Substrate Sheets
C 1328—05	Specification for Plastic (Stucco Cement
C 1386—07	Specification for Precast Autoclaved Aerated Concrete (AAC) Wall Construction
C 1395/C 1395M—06a	Specification for Gypsum Ceiling Board
C 1396M—09a	Specification for Gypsum Board
C 1405—10	Standard Specification for Glazed Brick (Single Fired, Solid Brick Units
C 1492—03 (2009)	Standard Specification for Concrete Roof
C 1629/C 1629M—06	Standard Classification for Abuse-resistant Nondecorated Interior Gypsum Panel Products and Fiber-reinforced Cement Panels
C 1658/C 1658M—06	Standard Specification for Glass Mat Gypsum Panels
D 25—99 (2005)	Specification for Round Timber Piles
D 41—05 (2010)	Specification for Asphalt Primer Used in Roofing, Dampproofing and Waterproofing
D 43—00 (2006)	Specification for Coal Tar Primer Used in Roofing, Dampproofing and Waterproofing
D 56—05	Test Method for Flash Point By Tag Closed Tester

D 86—10a	Test Method for Distillation of Petroleum Products at Atmospheric Pressure
D 93—10	Test Method for Flash Point ByPensky-MartensClosed Cup Tester
D 225—07	Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules
D 226/D 226M-09	Specification for Asphalt-saturated Organic Felt Used in Roofing and Waterproofing
D 227—03	Specification for Coal-tar-saturated Organic Felt Used in Roofing and Waterproofing
D 312—00 (2006)	Specification for Asphalt Used in
D 422—63 (2007)	Test Method for Particle-size Analysis of Soils
D 448—08	Standard Classification for Sizes of Aggregate for Road and Bridge
D 450—07	Specification for Coal-tar Pitch Used in Roofing, Dampproofing and Waterproofing
D 635—10	Test Method for Rate of Burning and/or Extent and Time of Burning of Self-supporting Plastics in a Horizontal Position
D 1143/D 1143M—07e1	Test Method for Piles Under Static Axial Compressive Load
D 1227—95 (2007)	Specification for Emulsified Asphalt Used as a Protective Coating for Roofing
D 1557—09	Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort [56,000 ft-lb/ft <sup>3</sup> (2,700 KN m/m <sup>3</sup> )]
D 1586—08a	Specification for Penetration Test and Split-barrel Sampling of Soils
D 1761—06	Test Method for Mechanical Fasteners in Wood
D 1863—05	Specification for Mineral Aggregate Used on Built-up Roofs
D 1929—96 (2001)e01	Test Method for Determining Ignition Properties of Plastics
D 1970—09	Specification for Self-adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roof Underlayment for Ice Dam Protection
D 2166—06	Test Method for Unconfined Compressive Strength of Cohesive Soil
D 2178—04	Specification for Asphalt Glass Felt Used in Roofing and Waterproofing

D 2216—10	Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
D 2487—10	Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
D 2626—04	Specification for Asphalt Saturated and Coated Organic Felt Base Sheet Used in Roofing
D 2822—05	Specification for Asphalt Roof Cement
D 2823—05	Specification for Asphalt Roof Coatings
D 2843—10	Test for Density of Smoke from the Burning or Decomposition of Plastics
D 2850—03a (2007)	Test Method for Unconsolidated, Undrained Triaxial Compression Test on Cohesive Soils
D 2898—10	Test Methods for Accelerated Weathering of Fire-retardant-treated Wood for Fire Testing
D 3019—08	Specification for Lap Cement Used with Asphalt Roll Roofing, Nonfibered, Asbestos Fibered and NonasbestosFibered
D 3161—09	Test Method for a Wind Resistance of Asphalt Shingles (Fan Induced Method)
D 3200—74 (2005)	Standard Specification and Test Method for Establishing Recommended Design Stresses for Round Timber Construction Poles
D 3201—08ae1	Test Method for Hygroscopic Properties of Fire-retardant-treated Wood and Wood-based Products
D 3278—96(2004)e01	Test Methods for Flash Point of Liquids by Small Scale Closed-cup Apparatus
D 3462/ D3462M-10a	Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules
D 3468—99 (2006)e1	Specification for Liquid-applied Neoprene and Chlorosulfonated Polyethylene Used in Roofing and Waterproofing
D 3679—09a	Specification for Rigid Poly [Vinyl Chloride (PVC) Siding]
D 3689—07	Method for Testing Individual Piles Under Static Axial Tensile Load
D 3737—09	Practice for Establishing Allowable Properties for Structural Glued Laminated Timber (Glulam)
D 3746—85 (2008)	Test Method for Impact Resistance of Bituminous Roofing Systems
D 3747—79 (2007)	Specification for Emulsified Asphalt Adhesive for Adhering Roof Insulation

D 3909—97b (2004)e01	Specification for Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules
D 3957—09	Standard Practices for Establishing Stress Grades for Structural Members Used in Log Buildings
D 4022—07	Specification for Coal Tar Roof Cement, Asbestos Containing
D 4272—09	Test Method for Total Energy Impact of Plastic Films by Dart Drop
D 4318—10	Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils
D 4434/D 4434M-09	Specification for Poly (Vinyl Chloride) Sheet Roofing
D 4479—07	Specification for Asphalt Roof Coatings—Asbestos-free
D 4586—07	Specification for Asphalt Roof Cement—Asbestos-free
D 4601—04	Specification for Asphalt-coated Glass Fiber Base Sheet Used in Roofing
D 4637/D 4637M-10	Specification for EPDM Sheet Used in Single-ply Roof Membrane
D 4829—08a	Test Method for Expansion Index of Soils
D 4869—05e01	Specification for Asphalt-saturated (Organic Felt) Underlayment Used in Steep Slope Roofing
D 4897/D 4897M-01(2009)	Specification for Asphalt-coated Glass Fiber Venting Base Sheet Used in Roofing
D 4945—08	Test Method for High-strain Dynamic Testing of Piles
D 4990—97a (2005)e1	Specification for Coal Tar Glass Felt Used in Roofing and Waterproofing.
D 5019—07a	Specification for Reinforced Nonvulcanized Polymeric Sheet Used in Roofing Membrane
D 5055—10	Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-joists
D 5456—10	Specification for Evaluation of Structural Composite Lumber Products
D 5516—09	Test Method of Evaluating the Flexural Properties of Fire-retardant-treated Softwood Plywood Exposed to the Elevated Temperatures
D 5643—06	Specification for Coal Tar Roof Cement, Asbestos-free

D 5664—10	Test Methods for Evaluating the Effects of Fire-retardant Treatment and Elevated Temperatures on Strength Properties of Fire-retardant-treated Lumber
D 5665—99a (2006)	Specification for Thermoplastic Fabrics Used in Cold-applied Roofing and Waterproofing
D 5726—98 (2005)	Specification for Thermoplastic Fabrics Used in Hot-applied Roofing and Waterproofing .
D 6083—05e01	Specification for Liquid Applied Acrylic Coating Used in Roofing
D 6162—00a (2008)	Specification for Styrene-butadiene-styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements
D 6163—00 (2008)	Specification for Styrene-butadiene-styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements
D 6164—05 e1	Specification for Styrene-butadiene-styrene (SBS) Modified Bituminous Sheet Metal Materials Using Polyester Reinforcements
D 6222—08	Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Polyester Reinforcements
D 6223/D6223M-02(2009)e1	Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements
D 6298—05e1	Specification for Fiberglass Reinforced Styrene-butadiene-styrene (SBS) Modified Bituminous Sheets with a Factory Applied Metal Surface
D 6305—08	Practice for Calculating Bending Strength Design Adjustment Factors for Fire-retardant-treated Plywood Roof Sheathing
D 6380—03 (2009)	Standard Specification for Asphalt Roll Roofing (Organic) Felt
D 6509/D6509M-09	Standard Specification for Atactic Polypropylene (APP) Modified Bituminous base Sheet Materials Using Glass Fiber Reinforcements
D 6694—08	Standard Specification for Liquid-applied Silicone Coating Used in Spray Polyurethane Foam Roofing
D 6754/D6754M-10	Standard Specification for Ketone Ethylene Ester Based Sheet Roofing

D 6757—07	Standard Specification for Inorganic Underlayment for Use with Steep Slope Roofing Products
D 6841—08	Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-retardant-treated Lumber
D 6878—08e1	Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing
D 6947—07	Standard Specification for Liquid Applied Moisture Cured Polyurethane Coating Used in Spray Polyurethane Foam Roofing System
D 7158—08d	Standard Test Method for Wind Resistance of Sealed Asphalt Shingles (Uplift Force/Uplift Resistance Method)
E 84—10b	Test Methods for Surface Burning Characteristics of Building Materials
E 90—09	Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
E 96/E 96M—05	Test Method for Water Vapor Transmission of Materials
E 108—10a	Test Methods for Fire Tests of Roof Coverings
E 119—10b	Test Methods for Fire Tests of Building Construction and Materials
E 136—09b	Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
E 330—02 (2010)	Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference
E 331—00 (2009)	Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference
E 492—09	Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-ceiling Assemblies Using the Tapping Machine
E 605—93 (2006)	Test Method for Thickness and Density of Sprayed Fire-resistive Material (SFRM) Applied to Structural Members.
E 681—09	Test Methods for Concentration Limits of Flammability of Chemical Vapors and Gases

E 736—00 (2006)	Test Method for Cohesion/Adhesion of Sprayed Fire-resistive Materials Applied to Structural Members
E 814—10	Test Method of Fire Tests of Through-penetration Firestops
E 970—10	Test Method for Critical Radiant Flux of Exposed Attic Floor Insulation Using a Radiant Heat Energy Source
E 1300—09a	Practice for Determining Load Resistance of Glass in Buildings.
E 1354—10a	Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
E 1592—05	Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
E 1602—03 (2010)e1	Guide for Construction of Solid Fuel-burning Masonry Heaters
E 1886—05	Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials
E 1966—07	Test Method for Fire-resistant Joint Systems.
E 1996—09	Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes
E 2072—10	Standard Specification for Photoluminescent (Phosphorescent) Safety Markings
E 2273—03	Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies
E 2307—10	Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-scale, Multistory Test Apparatus
E 2404—10	Standard Practice for Specimen Preparation and Mounting of Textile, Paper or Vinyl Wall or Ceiling Coverings to Assess Surface Burning Characteristics
E 2568—09e1	Standard Specification for PB Exterior Insulation and Finish Systems (EIFS)

E 2570—07	Standard Test Method for Evaluating Water-resistant Barrier (WRB) Coatings Used Under Exterior Insulation and Finish Systems (EIFS) for EIFS with Drainage
E 2573—07a	Standard Practice for Specimen Preparation and Mounting of Site-fabricated Stretch Systems to Assess Surface Burning Characteristics
F 547—06	Terminology of Nails for Use with Wood and Wood-based Materials
F 1346—91 (2003)	Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs
F 1667—10	Specification for Driven Fasteners: Nails, Spikes and Staples
F 2006—10	Standard/Safety Specification for Window Fall Prevention Devices for Nonemergency Escape (Egress) and Rescue (Ingress) Windows
F 2090—10	Specification for Window Fall Prevention Devices with Emergency Escape (Egress) Release Mechanisms
F 2200—05	Standard Specification for Automated Vehicular Gate Construction
G 152—06	Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
G 154—06	Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials
G 155—05a	Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials

The Association of the Wall and Ceiling Industries International  
 513 West Broad Street, Suite 210  
 Falls Church, VA 22046

**AWCI  
 Standard  
 reference  
 number**

12-B—05

**Title**

Technical Manual 12-B Standard Practice for the Testing and Inspection of Field Applied Thin Film Intumescent Fire-resistant Materials; an Annotated Guide, *Second* Edition

American Wood Protection Association  
 P.O. Box 361784  
 Birmingham, AL 35236-1784

#### **AWPA**

##### **Standard reference**

<b>number</b>	<b>Title</b>
C1—03	All Timber Products—Preservative Treatment by Pressure Processes
M4—06	Standard for the Care of Preservative-treated Wood Products
U1—10	USE CATEGORY SYSTEM: User Specification for Treated Wood Except Section 6, Commodity Specification H

American Welding Society  
 550 N.W. LeJeune Road  
 Miami, FL 33126

#### **AWS**

##### **Standard reference**

<b>number</b>	<b>Title</b>
D1.1—10	Structural Welding Code—Steel
D1.3—08	Structural Welding Code—Sheet Steel
D1.4—05	Structural Welding Code—Reinforcing Steel

Builders Hardware Manufacturers' Association  
 355 Lexington Avenue, 17th Floor  
 New York, NY 10017-6603

#### **BHMA**

##### **Standard reference**

<b>number</b>	<b>Title</b>
A 156.10—05	Power Operated Pedestrian Doors
A 156.19—07	Standard for Power Assist and Low Energy Operated Doors

Canadian General Standards Board  
 Place du Portage 111, 6B1  
 11 Laurier Street

Gatineau, Quebec, Canada KIA 1G6

**CGSB  
Standard  
Reference**

<b>Number</b>	<b>Title</b>
37-GP-52M (1984)	Roofing and Waterproofing Membrane, Sheet Applied, Elastomeric
37-GP-56M (1985)	Membrane, Modified, Bituminous, Prefabricated and Reinforced for Roofing—with December 1985 Amendment
CAN/CGSB 37.54—95	Polyvinyl Chloride Roofing and Waterproofing Membrane

Composite Panel Association  
19465 Deerfield Avenue, Suite 306  
Leesburg, VA 20176

**CPA  
Standard  
reference**

<b>number</b>	<b>Title</b>
ANSI A135.4—2004	Basic Hardboard
ANSI A135.5—2004	Prefinished Hardboard Paneling
ANSI A135.6—2006	Hardboard Siding

Consumer Product Safety Commission  
4330 East West Highway  
Bethesda, MD 20814-4408

**CPSC  
Standard  
reference**

<b>number</b>	<b>Title</b>
16 CFR Part 1201(1977)	Safety Standard for Architectural Glazing Material
16 CFR Part 1209 (1979)	Interim Safety Standard for Cellulose Insulation
<u>16 CFR Part 1301(1977)</u>	<u>Ban of Unstable Refuse Bins</u>
16 CFR Part 1404 (1979)	Cellulose Insulation

16 CFR Part 1500 (1991)	Hazardous Substances and Articles; Administration and Enforcement Regulations
16 CFR Part 1500.44 (2001)	Method for Determining Extremely Flammable and Flammable Solids
16 CFR Part 1507 (2001)	Fireworks Devices
16 CFR Part 1630 (2000)	Standard for the Surface Flammability of Carpets and Rugs

Canadian Standards Association  
5060 Spectrum Way, Suite 100  
Mississauga, Ontario, L4W 5N6 Canada

**CSA  
Standard  
reference  
number**

**Title**

101/I.S.2/A440—08	Specifications for Windows, Doors and Unit Skylights
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Cedar Shake and Shingle Bureau  
P.O. Box 1178  
Sumas, WA 98295-1178

**CSSB  
Standard  
reference  
number**

**Title**

CSSB—97	Grading and Packing Rules for Western Red Cedar Shakes and Western Red Shingles of the Cedar Shake and Shingle Bureau
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Door and Access Systems Manufacturers Association International  
1300 Summer Avenue  
Cleveland, OH 44115-2851

**DASMA  
Standard  
reference  
number**

**Title**

ANSI/DASMA 107—1997	
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(R2004)	Room Fire Test Standard for Garage Doors Using Foam Plastic Insulation
108—05	Standard Method for Testing Sectional Garage Doors and Rolling Doors: Determination of Structural Performance Under Uniform Static Air Pressure Difference
115—05	Standard Method for Testing Sectional Garage Doors and Rolling Doors: Determination of Structural Performance Under Missile Impact and Cyclic Wind Pressure

U.S. Department of Commerce  
National Institute of Standards and Technology  
1401 Constitution Avenue, NW  
Washington, DC 20230

#### **DOC**

##### **Standard reference number**

##### **Title**

PS-1—07	Structural Plywood
PS-2—04	Performance Standard for Wood-based Structural-use Panels
PS 20—05	American Softwood Lumber Standard

U.S. Department of Labor  
c/o Superintendent of Documents  
U.S. Government Printing Office  
Washington, DC 20402-9325

#### **DOL**

##### **Standard reference number**

##### **Title**

29 CFR Part 1910.1000 (1974)	Air Contaminants
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U.S. Department of Transportation  
c/o Superintendent of Documents

1200 New Jersey Avenue, SE  
Washington, DC 20402-9325

**DOTn**

**Standard**

**reference**

**number**

**Title**

49CFRParts 100-185-2005

Hazardous Materials Regulations

49 CFR Parts 173.137  
(2005)

Shippers—General Requirements for Shipments  
and Packaging—Class 8—Assignment of Packing  
Group

49 CFR—1998

Specification of Transportation of Explosive and  
Other Dangerous Articles,  
UN 0335, UN 0336 Shipping Containers

European Committee for Standardization (EN)  
Central Secretariat  
Rue de Stassart 36  
B-10 50 Brussels

**EN**

**Standard**

**reference**

**number**

**Title**

EN 1081-98  
Resilient Floor Coverings

Resilient Floor Coverings—Determination of the Electrical  
Resistance

Federal Emergency Management Agency  
Federal Center Plaza  
500 C Street S.W.  
Washington, DC 20472

**FEMA**

**Standard**

**reference**

**number**

**Title**

FIA-TB11—01

Crawlspace Construction for Buildings Located in  
Special Flood Hazard Areas

Factory Mutual Global Research

Standards Laboratories Department  
1301 Atwood Avenue, P.O. Box 7500  
Johnson, RI 02919

**FM****Standard  
reference  
number****Title**

4450 (1989)	Approval Standard for Class 1 Insulated Steel Deck Roofs—with Supplements through July 1992
4470 (2010)	Approval Standard for Class 1 Roof Covers
4474 (04)	Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures
4880 (2010)	American National Standard for Evaluating Insulated Wall or Wall and Roof/ Ceiling Assemblies, Plastic Interior Finish Materials, Plastic Exterior Building Panels, Wall/Ceiling Coating Systems, Interior and Exterior Finish Systems

Gypsum Association  
810 First Street N.E. #510  
Washington, DC 20002-4268

**GA****Standard  
reference  
number****Title**

GA 216—10	Application and Finishing of Gypsum Panel Products
GA 600—09	Fire-resistance Design Manual, 18th Edition

Hardwood Plywood Veneer Association  
1825 Michael Faraday Drive  
Reston, VA 20190-5350

**HPVA****Standard  
reference  
number****Title**

HP-1—2009	Standard for Hardwood and Decorative Plywood
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U.S. Department of Housing and Urban Development  
451 7th Street, SW,  
Washington, DC 20410

**HUD****Standard  
reference  
number****Title**

HUD 24 CFR Part 3280 (1994)      Manufactured Home Construction and  
Safety Standards

International Code Council, Inc.  
500 New Jersey Ave, NW 6th Floor  
Washington, DC 20001

**ICC****Standard  
reference  
number****Title**

ICC/ANSI A117.1—09      Accessible and Usable Buildings and Facilities  
ICC 300—07      ICC Standard on Bleachers, Folding and Telescopic  
Seating and  
ICC 400—07      Standard on Design and Construction of Log  
Structures  
ICC 500—08      ICC/NSSA Standard on the Design and  
Construction of Storm  
ICC 600—08      Standard for Residential Construction in High Wind  
Regions  
IEBC – 09      International Existing Buildings Code  
IECC—09      International Energy Conservation Code (*adoption  
includes only section 101 of chapter 1 and chapters  
2 through 6*)  
~~IFC—09      International Fire Code~~  
IFGC—09      International Fuel Gas Code (*including ICC  
Emergency Amendment changing IFGC Sections  
406.7*)  
SBCCI SSTD 11—99      Test Standard for Determining Wind Resistance of  
Concrete or Clay Roof Tiles

International Organization for Standardization  
ISO Central Secretariat,

1 ch, de la Voie-Creuse,  
Case Postale 56  
CH-1211 Geneva 20, Switzerland

**ISO****Standard  
reference  
number****Title**

ISO 8115—86 Cotton Bales—Dimensions and Density

National Association of Architectural Metal Manufacturers,  
800 Roosevelt Road,  
Bldg. C, Suite 312  
Glen Ellyn, IL 60137

**NAAMM****Standard  
reference  
number****Title**

FP 1001—07 Guide Specifications for Design of Metal Flag Poles

National Concrete Masonry Association,  
13750 Sunrise Valley,  
Herndon, VA 22071-4662

**NCMA****Standard  
reference  
number****Title**

TEK5-08 Details for Concrete Masonry Fire Walls

National Fire Protection Association  
1 Batterymarch Park  
Quincy, MA 02269-9101

**NFPA****Standard  
reference  
number****Title**

10—10 Portable Fire Extinguishers

11—10 Low Expansion Foam

12—08	Carbon Dioxide Extinguishing Systems
12A—04	Halon 1301 Fire Extinguishing Systems
13—10	Installation of Sprinkler Systems ( <i>including TIA 10-2</i> )
13D—10	Installation of Sprinkler Systems in One- and Two-family Dwellings and Manufactured Homes ( <i>including TIA 10-2</i> )
13R—10	Installation of Sprinkler Systems in Residential Occupancies Up to and Including Four Stories in Height ( <i>including TIA 10-2</i> )
14—10	Installation of Standpipe and Hose System
16—07	Installation of Foam-water Sprinkler and Foam-water Spray Systems
17—09	Dry Chemical Extinguishing Systems
17A—09	Wet Chemical Extinguishing
20—10	Installation of Stationary Pumps for Fire Protection
30—08	Flammable and Combustible Liquids Code
31—06	Installation of Oil-burning Equipment
32—07	Dry Cleaning Plants
40—11	Storage and Handling of Cellulose Nitrate Film
58—11	Liquefied Petroleum Gas Code
61—08	Prevention of Fires and Dust Explosions in Agricultural and Food Product Facilities
<del>70—08</del>	<del>National Electrical Code (<i>This edition applies only to one-, two-, and three family dwellings</i>)</del>
70—11	National Electrical Code ( <i>including TIA 11-1</i> ) ( <del><i>This edition applies to all buildings other than one-, two-, and three family dwellings</i></del> )
72—10	National Fire Alarm <i>and Signaling</i> Code
80—10	Fire Doors and Other Opening Protectives
85—07	Boiler and Combustion System Hazards Code (Note: NFPA 8503 has been incorporated into NFPA 85)
92B—09	Smoke Management Systems in Malls, Atria and Large Spaces
99—05	Standard for Health Care Facilities
105—10	Standard for the Installation of Smoke Door Assemblies
110—10	Emergency and Standby Power Systems
111—10	Stored Electrical Energy Emergency and Standby Power Systems

120—10	Coal Preparation Plants
170—09	Standard for Fire Safety and Emergency Symbols
211—10	Chimneys, Fireplaces, Vents and Solid Fuel-burning
252—08	Standard Methods of Fire Tests of Door Assemblies
253—06	Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
257—07	Standard for Fire Test for Window and Glass Block Assemblies
259—08	Test Method for Potential Heat of Building Materials
265—07	Method of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Wall Coverings on Full Height Panels and Walls
268—07	Standard Test Method for Determining Ignitibility of Exterior Wall Assemblies Using a Radiant Heat Energy Source
285—06	Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components
286—06	Standard Method of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
288—07	Standard Method of Fire Tests of Floor Fire Door Assemblies Installed Horizontally in Fire-resistance-rated Floor Systems
409—11	Aircraft Hangars
418—06	Standard for Heliports
484—09	Combustible Metals
654—06	Prevention of Fire & Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids
655—07	Prevention of Sulfur Fires and Explosions
664—07	Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities
701—10	Standard Methods of Fire Tests for Flame-propagation of Textiles and Films
704—07	Standard System for the Identification of the Hazards of Materials for Emergency Response

1124—06                      Manufacture, Transportation and Storage of  
Fireworks and Pyrotechnic Articles  
2001—08                      Clean Agent Fire Extinguishing Systems

Precast Prestressed Concrete Institute  
175 W. Jackson Boulevard, Suite 500  
Chicago, IL 60604-6938

**PCI**  
**Standard**  
**reference**  
**number**

	<b>Title</b>
MNL 124—89	Design for Fire Resistance of Precast Prestressed Concrete
MNL 128—01	Recommended Practice for Glass Fiber Reinforced Concrete Panels

Post-Tensioning Institute  
8601 North Black Canyon Highway, Suite 103  
Phoenix, AZ 85021

**PTI**  
**Standard**  
**reference**  
**number**

	<b>Title</b>
PTI—2008	Standard Requirements for Analysis of Shallow Concrete Foundations on Expansive Soils, Third Edition
PTI—2008	Standard Requirements for Design of Shallow Post-tensioned Concrete Foundation on Expansive Soils, Second Edition

Rack Manufacturers Institute  
8720 Red Oak Boulevard, Suite 201  
Charlotte, NC 28217

**RMI**  
**Standard**  
**reference**  
**number**

	<b>Title</b>
ANSI/MH16.1—08	Specification for Design, Testing and Utilization of Industrial Steel Storage Racks

Steel Deck Institute,  
P. O. Box 25  
Fox River Grove, IL 60021

**SDI****Standard  
reference  
number****Title**

ANSI/NC1.0—06  
ANSI/RD1.0—06

Standard for Noncomposite Steel Floor Deck  
Standard for Steel Roof Deck

Steel Joist Institute,  
1173B London Links Drive  
Forest, VA 24551

**SJI****Standard  
reference  
number****Title**

CJ-1.0—06

Standard Specification for Composite Steel Joists,  
CJ-series

JG-1.1—05

Standard Specification for Joist Girders

K-1.1—05

Standard Specification for Open Web Steel Joists,  
K-series

LH/DLH-1.1—05

Standard Specification for Longspan Steel Joists,  
LH-series and Deep Longspan Steel Joists, DLH-  
series

Single-Ply Roofing Institute,  
411 Waverly Oaks Road, Suite 331B,  
Waltham, MA 02452

**SPRI****Standard  
reference  
number****Title**

SPRI/ANSI/ES-1—03

Wind Design Standard for Edge Systems Used with  
Low Slope Roofing Systems

RP-4—02

Wind Design Guide for Ballasted Single-ply  
Roofing Systems

Telecommunications Industry Association  
 2500 Wilson Boulevard  
 Arlington, VA 22201-3834

**TIA**

**Standard  
 reference**

**number**

**Title**

TIA-222-G—09	Structural Standards for Steel Antenna Towers and Antenna Supporting Structures including-Addendum 1, 222-G-1, Dated 2007
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The Masonry Society,  
 3970 Broadway, Unit 201-D,  
 Boulder, CO 80304-1135

**TMS**

**Standard  
 reference**

**number**

**Title**

0216—07	Standard Method for Determining Fire Resistance of Concrete and Masonry Construction Assemblies
0302—07	Standard Method for Determining the Sound Transmission Class Rating for Masonry Walls
402—08	Building Code Requirements for Masonry Structures
602—08	Specification for Masonry Structures

Truss Plate Institute,  
 218 N. Lee Street, Suite 312  
 Alexandria, VA 22314

**TPI**

**Standard  
 reference**

**number**

**Title**

TPI 1—2007	National Design Standards for Metal-plate-connected Wood Truss Construction
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Underwriters Laboratories, Inc.  
 333 Pfingsten Road

Northbrook, IL 60062-2096

**UL  
Standard  
reference  
number**

**Title**

9—09	Fire Tests of Window Assemblies
10A—09	Tin Clad Fire Doors
10B—08	Fire Tests of Door Assemblies
10C—09	Positive Pressure Fire Tests of Door Assemblies
14B—08	Sliding Hardware for Standard Horizontally-mounted Tin Clad Fire Doors
14C—06	Swinging Hardware for Standard Tin Clad Fire Doors Mounted Singly and in Pairs
103—10	Factory-built Chimneys, for Residential Type and Building Heating Appliances
127—08	Factory-built Fireplaces
199E—04	Outline of Investigation for Fire Testing of Sprinklers and Water Spray Nozzles for Protection of Deep Fat Fryers.
217—06	Single and Multiple Station Smoke Alarms
263—03	Standard for Fire Test of Building Construction and Materials
268—09	Smoke Detectors for Fire Protective Signaling Systems
300—05	Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas
305—97	Panic Hardware
325—02	Door, Drapery, Gate, Louver and Window Operations and Systems—with Revisions through February 2006
555—2006	Fire Dampers
555C—2006	Ceiling Dampers
555S—99	Smoke Dampers—with Revisions through July 2006
580—2006	Test for Uplift Resistance of Roof Assemblies
641—95	Type L Low-temperature Venting Systems
710B—04	Recirculating Systems—with Revisions through April 2006
723—08	Standard for Test for Surface Burning Characteristics of Building Materials
790—04	Standard Test Methods for Fire Tests of Roof Coverings
793—08	Standards for Automatically Operated Roof Vents for Smoke and Heat
864—03	Standards for Control Units and Accessories for Fire Alarm Systems—with Revisions through March 2006

924—06	Standard for Safety Emergency Lighting and Power Equipment
1040—96	Fire Test of Insulated Wall Construction—with Revisions through June 2001
1256—02	Fire Test of Roof Deck Construction—with Revisions through January 2007
1479—03	Fire Tests of Through-penetration Firestops—with Revisions through April 2007
1482—10	Solid-fuel-type Room Heater
1715—97	Fire Test of Interior Finish Material—with Revisions through March 2004
1777—07	Chimney Liners
1784—01	Air Leakage Tests of Door Assemblies—with Revisions through December 2004
1897—04	Uplift Tests for Roof Covering Systems
1975—06	Fire Test of Foamed Plastics Used for Decorative Purposes
1994—04	Standard for Luminous Egress Path Marking Systems—with Revisions through February 2005
2017—08	Standards for General-purpose Signaling Devices and Systems
2079—04	Tests for Fire Resistance of Building Joint Systems—with Revisions through March 2006
2200—98	Stationary Engine Generator Assemblies

Underwriters Laboratories of Canada,  
7 Underwriters Road,  
Toronto, Ontario, Canada M1R3B4

**ULC**  
**Standard**  
**reference**  
**number**

	<b>Title</b>
CAN/ULC S102.2—2010	Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies—with 2000 Revisions

United States Code,  
c/o Superintendent of Documents  
U.S. Government Printing Office,  
Washington, DC 20402-9325

**USC  
Standard  
reference  
number**

**Title**

*10 U.S.C. Sections 18233(A)(1) and 18237-1994*

18 USC Part 1, Ch.40      Importation, Manufacture, Distribution and Storage  
of Explosive Materials

Window and Door Manufacturers Association  
1400 East Touhy Avenue #470  
Des Plaines, IL 60018

**WDMA  
Standard  
reference  
number**

**Title**

AAMA/WDMA/CSA

101/I.S.2/A440—08      Specifications for Windows, Doors and Unit  
Skylights

Wire Reinforcement Institute, Inc.  
942 Main Street, Suite 300  
Hartford, CT 06103

**WRI  
Standard  
reference  
number**

**Title**

WRI/CRSI—81      Design of Slab-on-ground Foundations—with 1996 Update

Effective: 03/01/2013

R.C. 119.032 review dates: 11/01/2016

CERTIFIED ELECTRONICALLY

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Certification

02/08/2013

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Date

Promulgated Under: 119.03  
Statutory Authority: 3781.10(A)  
Rule Amplifies: 3781.10, 3781.11, 3791.04  
Prior Effective Dates: 9/1/92, 2/1/93, 7/1/95, 7/1/97, 3/1/98, 7/1/98, 1/1/99,  
12/1/00, 1/1/02, 3/1/05, 9/6/05, 3/1/06, 7/1/07, 1/1/08,  
3/31/08(Emer.), 6/24/08, 1/1/09, 11/1/11, 3/15/12