

ORDINANCE NO.

AN ORDINANCE REPEALING AND REPLACING ARTICLE 1 OF CITY CODE
CHAPTER 25-12 TO ADOPT THE 2012 INTERNATIONAL BUILDING CODE
AND LOCAL AMENDMENTS.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

PART 1. Article 1, Division 1 (*Building Code*) of City Code Chapter 25-12 (*Technical Codes*) is repealed and replaced with a new Article 1, Division 1, to read as follows:

ARTICLE 1. BUILDING CODE.

Division 1. International Building Code and Local Amendments

§ 25-12-1 BUILDING CODE.

(A) The 2012 International Building Code published by the International Code Council is adopted and incorporated into this section with deletions and amendments in Subsection (B) and Section 25-12-3 (*Local Amendments to the Building Code*).

(B) The following provisions of the 2012 International Building Code are deleted. All subsections contained within a deleted section or subsection are also deleted, even if not specifically listed below.

Sec. 101.2	Sec. 101.4.1	Sec 101.4.2	Sec. 101.4.3
Sec. 103	Sec. 104.10.1	Sec. 105.1.1	Sec. 105.1.2
Sec. 105.2	Sec. 105.3.2	Sec. 105.5	Sec. 107.2.5
Sec. 110.3.1	Sec 110.3.3	Sec. 110.3.5	Sec. 110.3.7
Sec. 110.3.10.1	Sec. 112.3	Sec. 113	Sec. 305.2
Sec. 305.2.2	Sec. 305.2.3	Sec. 308.3.1	Sec. 308.3.2
Sec. 308.4	Sec. 308.4.1	Sec. 308.6	Sec. 308.6.1
Sec. 308.6.3	Sec. 308.6.4	Sec. 310.3	Sec. 310.5.1
Sec. 403.2.1	Sec. 403.2.1.1	Sec. 403.2.1.2	Sec. 403.3
Sec. 403.5.3.1	Sec. 406.4.4	Sec. 406.5.7	Sec. 414.1.3
Sec. 501.2	Sec. 503.1.1	Sec. 507.2	Sec. 507.3
Sec. 510.4	Sec. 510.6	Sec. 713.14.1	Sec. 714.4.1.1.2

1	Sec. 718.5	Sec. 901.5	Sec. 903.2.6	Sec. 903.3.1.2.1
2	Sec. 903.3.1.3	Sec.903.3.5.2	Sec. 903.3.6	Sec. 904.9
3	Sec. 904.11	Sec. 905.1	Sec 905.3.1	Sec. 905.3.4.1
4	Sec. 905.4	Sec. 905.5.3	Sec. 906.1	Sec. 907.2
5	Sec. 907.2.7	Sec. 907.2.8.1	Sec. 907.2.8.2	Sec. 907.2.9
6	Sec. 907.2.9.1	Sec. 907.2.9.2	Sec. 907.2.13.2	Sec. 907.4.1
7	Sec. 907.5.2.3.4	Sec. 907.6.5	Sec. 909	Sec. 912.1
8	Sec. 912.3	Sec. 912.3.1	Table 1004.1.2	Sec. 1005.3.1
9	Sec. 1005.3.2	Sec. 1007.3	Sec. 1008.1.2	Sec. 1008.1.4.3
10	Sec. 1008.1.9.7	Sec. 1008.1.9.8	Sec. 1021.2	Table 1021.2(1)
11	Table 1021.2(2)	Sec. 1015.2.1	Sec. 1018.4	Sec. 1026.3
12	Sec. 1101.1	Sec. 1101.2	Sec. 1104.1	Sec. 1106.6
13	Sec. 1107.6.1.2	Sec. 1107.6.2.1.2	Sec. 1107.6.2.2	Sec. 1107.6.3
14	Sec. 1107.6.4.2	Sec. 1109.15	Sec. 1301	Sec. 1507.8
15	Sec. 1507.8.1	Sec. 1507.8.1.1	Sec. 1507.8.2	Sec. 1507.8.3
16	Sec. 1507.8.3.1	Table 1507.8	Sec. 1507.8.4	Sec. 1507.8.5
17	Table 1507.8.5	Sec. 1507.8.6	Sec. 1507.8.7	Table 1507.8.7
18	Sec. 1507.8.8	Sec. 1507.9	Sec. 1507.9.1	Sec. 1507.9.1.1
19	Sec. 1507.9.2	Sec. 1507.9.3	Sec. 1507.9.3.1	Sec. 1507.9.4
20	Sec. 1507.9.5	Sec. 1507.9.6	Table 1507.9.6	Sec. 1507.9.7
21	Sec. 1507.9.8	Sec. 1507.9.9	Sec. 1603.1.3	Sec. 1603.1.4
22	Sec. 1607.8.1	Sec. 1607.10.2	Sec. 1612	Sec. 1704.2.3
23	Sec. 2407.1	Sec. 3102.1	Sec. 3109.3	Sec. 3201.1
24	Sec. 3202.1	Sec. 3202.2.1	Sec. 3202.3.3	Chapter 34

(C) The city clerk shall file a copy of the 2012 International Building Code with the official ordinances of the City.

§ 25-12-2 CITATIONS TO THE BUILDING CODE.

In the City Code, “Building Code” means the 2012 International Building Code adopted by Section 25-12-1 (*Building Code*), as amended by Section 25-12-1 (*Building Code*) Subsection (B) and Section 25-12-3 (*Local Amendments to the Building Code*).

§ 25-12-3 LOCAL AMENDMENTS TO THE BUILDING CODE.

The following provisions are local amendments to the 2012 International Building Code. Each provision in this section is a substitute for the identically numbered provision deleted by Section 25-12-1(B) (*Building Code*) or is an addition to the 2012 International Building Code.

101.2 Scope. The provisions of the Building Code shall apply to the construction, alteration, addition, relocation, enlargement, replacement, repair, equipment, use and occupancy, including a change in occupancy, location, maintenance, removal, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures.

Exceptions:

1. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories above grade plane in height with a separate means of egress and their accessory structures shall comply with the International Residential Code.
2. Existing buildings undergoing repair, alteration, additions, relocation, or a change of use shall comply with the 2012 International Existing Building Code as adopted and incorporated into the City Code.

101.4.1 Gas. The provisions of the International Fuel Gas Code and the Plumbing Code shall apply to the installation of gas piping from the point of delivery, gas appliances, and related accessories as covered in this code. The Plumbing Code supersedes the International Fuel Gas Code to the extent of conflict. These requirements apply to gas piping systems extending from the point of delivery to the inlet connections of appliances and the installation and operation of residential and commercial gas appliances and related accessories.

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

101.4.3 Plumbing. The provisions of the International Plumbing Code and the Plumbing Code shall apply to the installation, alteration, repairs, and replacement of plumbing systems, including equipment, appliances, fixtures, fittings, and appurtenances, and

where connected to a water or sewage system and all aspects of a medical gas system. The Plumbing Code supersedes the International Plumbing Code to the extent of conflict. The provisions of the International Private Sewage Disposal Code and the Plumbing Code shall apply to private sewage disposal systems. The Plumbing Code supersedes the International Private Sewage Code to the extent of conflict.

103 Building official. The City Manager shall appoint a building official to administer and interpret this Code. The building official may appoint one or more deputy building officials.

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

Building:

1. One-story detached accessory structures used as tool and storage sheds, playhouses, and similar uses, provided the floor area is not greater than 120 square feet (11 m²); provided they are not located within a flood hazard area.
2. Fences not over 7 feet (2134 mm) high; provided they are not located within a flood hazard area.
3. Oil derricks; provided they are not located within a flood hazard area.
4. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II or IIIA liquids; provided they are not located within a flood hazard area.
5. Water tanks supported directly on grade if the capacity is not greater than 5,000 gallons (18 925 L) and the ratio of height to diameter or width is not greater than 2:1; provided they are not located within a flood hazard area.
6. Sidewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any basement or story below and are not part of an accessible route; provided they are not located within a flood hazard area.

7. Painting, papering, tiling, carpeting, cabinets, counter tops, and similar finish work.
8. Temporary motion picture, television, and theater stage sets and scenery.
9. Prefabricated swimming pools accessory to a Group R-3 occupancy that are less than 24 inches (610 mm) deep, are not greater than 5,000 gallons (18,925 L) and are installed entirely above ground; provided they are not located within a flood hazard area.
10. Shade cloth structures constructed for nursery or agricultural purposes, not including service systems; provided they are not located within a flood hazard area.
11. Swings and other playground equipment accessory to detached one- and two-family dwellings; provided they are not located within a flood hazard area.
12. Window awnings in Group R-3 and U occupancies, supported by an exterior wall that do not project more than 54 inches (1,372 mm) from the exterior wall and do not require additional support.
13. Nonfixed and movable fixtures, cases, racks, counters, and partitions not over 5 feet 9 inches (1,753 mm) in height.
14. Repair to gypsum board that is not part of a fire-resistance-rated wall, a shear assembly, or part of a shower or water closet surround; provided it is limited to a maximum of 32 square feet.

Electrical:

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

Radio and television transmitting stations: The provisions of this code are not applicable to electrical equipment used for radio and television transmissions, but do apply to equipment and wiring for a power supply and the installations of towers and antennas.

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

Gas:

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

Mechanical:

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

Plumbing:

1. The stopping of leaks in drains, water, soil, waste or vent pipe, provided, however, that if any concealed trap, drain pipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a permit shall be obtained and inspection made as provided in this code.

2. The clearing of stoppages or the repairing of leaks in pipes, valves, or fixtures and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

105.5 Time Limitation on Application; Permit Expiration and Reactivation. Time limits on permit applications and requirements for permit expiration and reactivation, including a review fee for expired permits, are set forth in City Code Chapter 25-12, Article 13 (*Administration of Technical Codes*).

105.8 Transfer of permit. The building official is authorized to establish a building permit transfer policy.

107.2.2.3 Fire protection at penetrations. Deferred submittal shop drawings and schedules that are submitted shall indicate the fire protective assemblies proposed for installation at all penetrations through fire and smoke construction in accordance with Sections 714 (*Penetrations*) and 715 (*Fire-Resistant Joint Systems*).

107.2.5 Site plan. The construction documents submitted with the application for permit shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and design flood elevations; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. For a building or structure involving below-grade construction, the site plan shall show the location of proposed earth retention system components allowed under Section 3202.1.4 (*Earth Retention System Components*). The building official is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration or repair or when otherwise warranted.

108.5 Temporary earth retention systems. Temporary earth retention system components used to facilitate below-grade construction of a building or structure shall conform to Sections 1811 (*Earth Retention Systems*) and Section 3202.1.4 (*Earth retention system components*).

109.7 Plan review fees. An applicant must pay a plan review fee, adopted by separate ordinance, when plans and specifications are submitted for review under Section 107 (*Submittal Documents*). The building official shall compute the building plan review fees using the total value of all construction work for which the permit is issued as well as the value of all finish work, painting, roofing, electrical, plumbing, heating, air conditioning, elevators, fire-extinguishing systems, and other permanent equipment. The building

official shall charge an additional plan review fee if plans are incomplete or changed so as to require additional plan review. The plan review fees referenced in this section are in addition to the permit fees referenced in Section 109.1 (*Payment of fees*).

110.3.1 Building pre-construction inspection. This is the first inspection conducted. The inspector verifies the permits that were issued for work at a site and meets with the contractor or owner at the site to review plans and identify potential issues. The inspector notifies the contractor of the inspector's work hours and identifies required inspections.

110.3.1.2 Layout Inspection. A layout inspection shall be made after all foundation forms have been erected and are in place, but before any concrete is placed.

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

110.3.1.3.1 Lowest floor elevation. In flood hazard areas, before placement of the lowest floor, including the basement, and prior to further vertical construction, the elevation certification required in Section 1612.5 (*Flood hazard documentation*) shall be submitted to and approved by the building official.

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

Exception: Gypsum board that is not part of a fire-resistance-rated wall, a shear assembly, or part of a shower or water closet surround; provided it is limited to a maximum of 32 square feet.

110.3.7 Energy efficiency inspections. Inspections shall be made to determine compliance with the energy efficiency requirements of the Energy Code, as adopted by Chapter 25-12, Article 12 (*Energy Code*), and shall include, but not be limited to, inspections for: envelope insulation R and U values, fenestration U value, duct system R value, and HVAC and water-heating equipment efficiency.

110.3.10.1 Flood hazard documentation. If located in a flood hazard area, documentation of the elevation of the lowest floor as required in Section 1612.5 shall be submitted to and approved by the building official prior to the final inspection.

110.7 Inspectors. An inspection conducted under this code shall be performed by an inspector employed by the City or by a non-city employee approved by the building official. A person hired by the City as a building inspector after the effective date of the Building Code, must attain certification as a Commercial Building Inspector and as a

Commercial Energy Inspector within one year of the person's date of employment under the certification program established by the International Code Council.

111.5 Maintenance of records. The building owner, or the owner's authorized agent, must maintain a copy of the certificate of occupancy on the premises and provide it to an authorized official on request.

112.3 Authority to disconnect service utilities. The building official may authorize the disconnection of utility service to the building, structure, or service system regulated by this code and the codes referenced under this section.

112.3.1 Circumstances for which utilities may be disconnected. The building official may authorize the disconnection of utilities if the building official determines that:

1. disconnection is necessary to eliminate an immediate hazard to life or property;
2. an owner or occupant is in violation of a stop work order;
3. electrical work has been installed without a permit;
4. plumbing or gas piping has been installed without a permit; or
5. development does not comply with Title 25 (*Land Development*).

112.3.2 Notice. This section prescribes notice requirements for disconnection of utilities.

112.3.2.1 Disconnection because of an immediate threat to life or property. If disconnection of utilities is necessary to eliminate an immediate hazard to life, the building official shall notify the serving utility and whenever possible, the owner and occupant of the building, structure, or service system of the decision prior to taking any action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing, by certified mail, return receipt requested, as soon as practical thereafter.

112.3.2.2 Disconnection for a reason other than an immediate threat to life or property. If the disconnection of utilities is for a reason other than to eliminate an immediate hazard to life, the building official shall give notice according to this section. Notice shall first be provided for the violation in accordance with the applicable section of City Code Title 25 (*Land Development*). The notice of violation shall include a statement that the building official may authorize the disconnection of utilities if the violation is not cured within the timeframe established in the notice of violation. If the owner or occupant fails to comply with the notice of violation, the building official may issue a notice to the owner and occupant stating that utilities to the property will be disconnected not less than one week after the date that the notice is mailed. The notice must identify each utility that will be disconnected.

SECTION 113 BUILDING AND FIRE CODE BOARD OF APPEALS

Regulations regarding the Building and Fire Code Board of Appeals are found in Chapter 2-1 of the City Code.

SECTION 202 DEFINITIONS

202.1 Supplemental Definitions. The definitions in this subsection apply throughout this code and amend or supplement the definitions in Section 202 (*General Definitions*) in the 2012 International Building Code, as published.

BALCONY, EXTERIOR. An exterior floor projected from and supported by a structure without additional independent supports.

BASE FLOOD. A flood having a 1-percent chance of being equaled or exceeded in any given year (100-year flood).

BED AND BREAKFAST. A private residence having a limited number of sleeping rooms which are available for transient guests who have paid for accommodations. For the different classifications of Bed and Breakfast, refer to LDC 25-2-781 (*Bed and Breakfast Residential Use Structures Classified*).

DECK. An exterior floor supported on at least two opposing sides by an adjacent structure, and/or post, piers or other independent supports.

DESIGN FLOOD. The flood associated with an area with a flood plain subject to a 1-percent or greater chance of flooding in any year (100-year flood) based on projected full development in accordance with the City of Austin Drainage Criteria Manual.

DESIGN FLOOD ELEVATION. The elevation of the “design flood relative to the City of Austin vertical datum standard.

EXISTING CONSTRUCTION. Any buildings and structures for which the *start of construction* commenced before September 2, 1981. “Existing construction” is also referred to as “existing structures.”

FLOOD HAZARD AREA. The greater of the following two areas:

1. An area within a flood plain subject to a 1-percent or greater chance of flooding in any year (100-year flood); or
2. An area with a flood plain subject to a 1-percent or greater chance of flooding in any year (100-year flood) based on projected full development in accordance with the City of Austin Drainage Criteria Manual.

FLOODWAY. The channel of the river, creek or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively

1 increasing the water surface elevation more than a designated height. An area with a
2 flood plain subject to a 4-percent or greater chance of flooding in any year (25-year
3 flood) based on projected full development in accordance with the City of Austin
4 Drainage Criteria Manual.

5 **NEW CONSTRUCTION (for Section 1612 Flood Loads).** Structures for which
6 the start of construction commenced on or after September 2, 1981 and includes any
7 subsequent improvements to such structures and improvements to all existing
8 construction.

9 **REGULATORY FLOOD DATUM.** An established plane of reference from which
10 elevations and depth of flooding may be determined for specific locations of the
11 floodplain. It is the water level of the design flood plus a freeboard factor of one foot.
12 Design flood plus freeboard equals Regulatory Flood Datum.

13 **START OF CONSTRUCTION.** The date of permit issuance for new construction and
14 substantial improvements to existing structures, provided the actual start of construction,
15 repair, reconstruction, rehabilitation, addition, placement, or other improvement is within
16 180 days after the date of issuance. The actual start of construction means the first
17 placement of permanent construction of a building (including a manufactured home) on a
18 site, such as the pouring of a slab or footings, installation of pilings, or construction of
19 columns. Permanent construction does not include land preparation (such as clearing,
20 excavation, grading, or filling), the installation of streets or walkways, excavation for a
21 basement, footings, piers or foundations, the erection of temporary forms, or the
22 installation of accessory buildings such as garages or sheds not occupied as dwelling
23 units or not part of the main building. For a substantial improvement, the actual “start of
24 construction” means the first alteration of any wall, ceiling, floor or other structural part
25 of a building, whether or not that alteration affects the external dimensions of the
26 building.

27 **SUBSTANTIAL IMPROVEMENT.** For the purpose of determining compliance with
28 the flood hazard management provisions of this code, substantial improvement means
29 any repair, alteration, reconstruction, rehabilitation, addition, or improvement of a
30 building or structure, the cost of which equals or exceeds 50 percent of the current market
31 value of the structure before the improvement or repair is started or, if the structure has
32 been damaged and is being restored, before the damage occurred. The cost used in the
33 substantial improvement determination shall be cumulative cost of all previous additions
34 or improvements for a specific building or structure occurring during the immediate 10-
35 year period. If the structure has sustained substantial damage, any repairs are considered
36 substantial improvement regardless of the actual repair work performed. The term does
37 not, however, include either:

1. Any project for improvement of a building required to correct existing health, sanitary or safety code violations identified by the building official and that are the minimum necessary to assure safe living conditions.
2. Any alteration of a historic structure provided that the alteration will not preclude the structure's continued designation as a historic structure.
3. An aesthetic improvement if the value of the improvement does not exceed 10 percent of the current market value of the building or structure.

202.1.2 Deleted Definitions. The definition of FLOOD HAZARD AREA SUBJECT TO HIGH VELOCITY WAVE ACTION is deleted from Section 202 (*General Definitions*) in the 2012 International Building Code, as published.

305.2 Group E, day care facilities. This group includes buildings and structures or portions thereof occupied by more than six children older than 2 ½ years of age who receive educational, supervision, or personal care services for fewer than 24 hours per day.

305.2.2 Six or fewer children. A facility having six or fewer children receiving such day care shall be classified as part of the primary occupancy.

305.2.3 Six or fewer children in a dwelling unit. A facility such as the above within a dwelling unit and having six or fewer children receiving such day care shall be classified as a Group R-3 occupancy or shall comply with the International Residential Code, provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 (*NFPA 13D sprinkler systems*) or with Section P2904 of the 2012 International Residential Code as published.

308.3.1 Six or fewer persons receiving care. A facility such as above with six or fewer persons receiving such care shall be classified as Group R-3 or shall comply with the International Residential Code, provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 (*NFPA 13D sprinkler systems*) or with Section P2904 of the 2012 International Residential Code as published.

308.3.2 Seven to sixteen persons receiving care. A facility such as the above, housing not fewer than seven and not more than 16 persons receiving such care, shall be classified as Group R-4.

308.4 Institutional Group I-2. This occupancy shall include buildings and structures used for medical care on a 24-hour basis for more than six persons who are incapable of self-preservation. This group shall include, but not be limited to, the following:

- Child care facilities
- Detoxification facilities
- Hospitals

Nursing homes
Psychiatric hospitals

308.4.1 Six or fewer persons receiving care. A facility such as the above with six or fewer persons receiving such care shall be classified as Group R-3 or shall comply with the International Residential Code, provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 (*NFPA 13D sprinkler systems*) or with Section P2904 of the 2012 International Residential Code as published.

308.6 Institutional Group I-4, day care facilities. This group shall include buildings and structures occupied by more than six persons of any age who receive custodial care for fewer than 24 hours per day by persons other than parents or guardians, relative by blood, marriage, or adoption, and in a place other than the home of the person cared for. This group shall include, but not be limited to, the following:

Adult day care

Child day care

308.6.1 Classification as Group E. A child care facility that provides care for more than six but no more than 100 children 2 ½ years or less of age, where the rooms in which the children are cared for are located on a level of exit discharge serving such rooms and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.

308.6.3 Six or fewer persons receiving care. A facility having six or fewer persons receiving custodial care shall be classified as part of the primary occupancy.

308.6.4 Six or fewer persons receiving are in a dwelling unit. A facility such as the above within a dwelling unit and having six or fewer persons receiving custodial care shall be classified as a Group R-3 occupancy or shall comply with the International Residential Code, provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 (*NFPA 13D sprinkler systems*) or with Section P2904 of the 2012 International Residential Code as published.

310.3 Residential Group R-1. Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

Boarding houses (transient) with more than 10 occupants

Congregate living facilities (transient) with more than 10 occupants

Hotels (transient)

Motels (transient)

Bed and Breakfasts

Exception: Compliance with Section 903.2.8 (*Group R*) is not required for a single structure Group R-1 Bed and Breakfast occupancy (*see City Code Section 25-2-781*) when the owner resides within the Bed and Breakfast occupancy and provided that:

1. the structure is a detached single family home that was legally constructed and occupied as a single family residence prior to January 1, 2006,
2. the total number of sleeping rooms has not been increased after January 1, 2006,
3. the residence is protected by a monitored residential style fire/security system with an appropriate automatic smoke detection system installed throughout the residence with occupant notification devices in accordance with Section 907.5(*Occupant notification systems*), and
4. The residential style fire/security system must be inspected, tested and maintained in accordance with Section 907.8 (*Inspection, testing and maintenance.*)

310.5.1 Care facilities within a dwelling. Care facilities for six or fewer persons receiving care that are within a single-family dwelling are permitted to comply with the International Residential Code, provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 (*NFPA 13D sprinkler systems*) or with Section P2904 of the 2012 International Residential Code as published.

Exception: Compliance with Section 903.3.1.3 (*NFPA 13D sprinkler systems*) is not required for adult care and child care facilities that are within the proprietor's single-family home; provided that the home was constructed and occupied as a residence prior to October 1, 2010.

403.2.1 Reduction in fire-resistance rating. The fire-resistance- rating reductions listed in Section 403.2.1.1 (*Type of construction*) 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 construction type allowed in Table 601 shall be allowed as provided in Section 403.2.1 (*Reduction in fire-resistance rating*):

1. Type 1A construction shall be allowed to be reduced to Type IB, except in buildings over 12 stories or over 160 feet high.
2. In other than Groups F-1, M, and S-1, Type IB construction shall be allowed to be reduced to Type IIA.

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

403.3 Automatic sprinkler system. Buildings and structures shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 (*NFPA 13 sprinkler system*) and a secondary water supply where required by Section 403.3.2 (*Water supply to required fire pumps*).

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

1. Stand-alone open parking garages in accordance with Section 406.5 (*Open parking garages*).
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 (*Where required – new buildings and structures*) and are separated from the remainder of the building by not less than 1-hour fire barriers constructed in accordance with Section 707 (*Fire Barriers*) or not less than 2-hour horizontal assemblies constructed in accordance with Section 711 (*Horizontal Assemblies*), or both.

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

Exception: The stairway communication system is not required in high rise buildings when all the following conditions are met;

1. Area of refuge communication system terminal, installed and maintained per International Building Code Sec. 1007.6.3 (*Two-way communication*), is located immediately adjacent to each floor level landing.
2. The area of refuge communication terminal is connected to an approved constantly attended station.
3. The door between the stair and the vestibule (area of refuge) cannot be locked.

- 1 4. An approved sign is provided at each floor level landing inside the
2 stairwell.

3 **403.7 Fire department communication systems.** A two-way fire department
4 communications system connected to an approved constantly attended station shall be
5 provided at every floor in each required stairway where the door to the stairway is locked.

6 **406.4.4 Ramps.** Vehicle ramps shall not serve as an exit element. Vehicle ramps that
7 serve as part of an accessible route shall not exceed a slope of 1:20 (5 percent).
8

9 **406.5.7 Means of egress.** Where persons other than parking attendants are permitted,
10 open parking garages shall meet the means of egress requirements of Chapter 10 (*Means*
11 *of Egress*). Lifts shall be permitted to be installed for use of employees only, provided
12 they are completely enclosed by noncombustible materials.
13

14 **414.1.3 Information required.** Separate floor plans shall be submitted for buildings and
15 structures with an occupancy in Group H, identifying the locations of anticipated contents
16 and processes, to reflect the nature of each occupied portion of every building and
17 structure. The floor plan shall identify the hazards associated with the contents and
18 processes. A report identifying hazardous materials including, but not limited to,
19 materials representing hazards that are classified in Group H to be stored or used, shall be
20 submitted and the methods of protection from such hazards shall be indicated on the
21 construction documents. The building official or fire marshal may also require a technical
22 opinion that addresses the adequacy of the protective measures provided. The opinion
23 and report shall be prepared by a qualified individual, firm or corporation approved by
24 the building official and fire marshal, and shall be provided without charge to the City of
25 Austin.
26

27 **501.2 Premises identification.** Approved numbers or addresses shall be provided on
28 new buildings in a position that is clearly visible and legible from the street or roadway
29 fronting the property. Letters or numbers shall comply with the requirements set out in
30 the Fire Code and in the Fire Protection Criteria Manual. When required by the fire code
31 official, address numbers shall be provided in additional approved locations to facilitate
32 emergency response.

33 **503.1.1 Special industrial occupancies.** In other than H occupancies, buildings and
34 structures designed to house special industrial processes that require large areas and
35 unusual building heights to accommodate craneways or special machinery and
36 equipment, including, among others, rolling mills; structural metal fabrication shops and
37 foundries; or the production and distribution of electric, gas or steam power, shall be
38 exempt from the building height and area limitations of Table 503.

507.3 Sprinklered, one story. The area of a Group B, F, M or S building no more than one story above grade plane of any construction type, or the area of a Group A-4 building no more than one story above grade plane of other than Type V construction, shall not be limited where the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 (*NFPA 13 sprinkler systems*), and is surrounded and adjoined by public ways or yards not less than 60 feet (18,288 mm) in width.

Exceptions:

1. Buildings and structures of Type I and II construction for rack storage facilities which do not have access by the public shall not be limited in height provided that such buildings conform to the requirements of Sections 507.3 (*Sprinklered, one story*), 903.3.1.1 (*NFPA 13 sprinkler systems*) and Chapter 32 (*High-Piled Combustible Storage*) of the International Fire Code.
2. The automatic sprinkler system shall not be required in the areas occupied for indoor participant sports such as tennis, skating, swimming, and equestrian activities in occupancies in Group A-4 provided that:
 - 2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas;
 - 2.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907 (*Fire Alarm and Detection Systems*); and
 - 2.3. Accessory and ancillary spaces shall be fully protected in accordance with NFPA 13.

510.4 Parking beneath Group R. Where a maximum one-story above grade plane Group S-2 parking garage, enclosed or open, or combination thereof, of Type I construction, with grade entrance, is provided under a building of Group R, the number of stories to be used in determining the minimum type of construction shall be measured from the floor above such a parking area. The floor assembly between the parking garage and the Group R above shall comply with the type of construction required for the parking garage and shall also provide a fire-resistance rating not less than 3 hours.

713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 708 (*Fire Partitions*) for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 (*Door assemblies in corridors and smoke barriers*) as required for corridor walls

and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 717.5.4.1 (*Corridors*). Elevator lobbies shall have at least one means of egress complying with Chapter 10 (*Means of Egress*) and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the level(s) of exit discharge, provided the level(s) of exit discharge is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1 (*NFPA 13 sprinkler systems*).
2. Elevators not required to be located in a shaft in accordance with Section 708.2 (*Shaft enclosure required*) are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6 (*Prohibited doors*). Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 (*Smoke and draft control*), when tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 (*NFPA 13 sprinkler systems*) or 903.3.1.2 (*NFPA 13R sprinkler systems*). This exception shall not apply to the following:
 - 4.1. Group I-2 occupancies;
 - 4.2. Group I-3 occupancies; and
 - 4.3. Elevators serving floor levels over 75 feet (22 860 mm) above the lowest level of fire department access in high-rise buildings.
- Exception:** Elevator lobbies shall be required for Occupant Evacuation Elevators.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 (*NFPA 13 sprinkler systems*) or 903.3.1.2 (*NFPA 13R sprinkler systems*). In addition to the requirements in Section 710 (*Smoke Partitions*) for smoke partitions, doors protecting openings in the smoke partitions shall also comply

with Sections 711.5.2.2 (*Smoke and draft control doors*), 711.5.2.3 (*Self- or automatic-closing doors*), and 715.5.9 (*Door closing*) and duct penetrations of the smoke partitions shall be protected as required for corridors in accordance with Section 717.5.4.1 (*Corridors*).

Exception: Elevator lobbies shall be required for Occupant Evacuation Elevators and Fire Service Access Elevators.

6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21 (*Elevator hoistway pressurization alternative*).

Exception: Elevator lobbies shall be required for Occupant Evacuation Elevators and Fire Service Access Elevators.

7. Enclosed elevator lobbies are not required where the elevator serves only open parking garages in accordance with Section 406.5 (*Open parking garages*).

714.4.1.1.2 Through-penetration firestop system. Through penetrations shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an F rating/T rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Exceptions:

1. Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T rating.
2. Floor penetrations by floor drains, tub drains or shower drains contained and located within the concealed space of a horizontal assembly do not require a T rating.
3. Penetrations by non-ferrous conduits or pipes up to 4 inches (101.6 mm) in diameter with the annular space protected with materials that have been demonstrated to prevent the passage of flame and hot gasses when the penetrations and penetrating materials are completely contained within a fire resistive assembly consisting of an approved fire rated wall assembly connected to an approved fire rated floor/ceiling assembly by an approved joint.

718.5 Combustible materials in concealed spaces in Type I or II construction. Combustible materials shall not be permitted in concealed spaces of buildings of Type I or II construction.

Exceptions:

1. Combustible materials in accordance with Section 603 (*Combustible Material in Type I and II Construction*).
2. Combustible materials exposed within plenums complying with Section 602 (*Plenums*) of the International Mechanical Code.
3. Class A interior finish materials classified in accordance with Section 803 (*Wall and Ceiling Finishes*).
4. Combustible piping within partitions or shaft enclosures installed in accordance with the provisions of this code.
5. Combustible piping within concealed ceiling spaces installed in accordance with the International Mechanical Code and the International Plumbing Code.

[F]901.5 Installation acceptance testing. Fire detection and alarm systems, fire-extinguishing systems, fire hydrant systems, fire standpipe systems, fire pump systems, private fire service mains, and all other fire protection systems and appurtenances thereto shall be subject to acceptance tests as contained in the installation standards and as approved by the fire department. The fire department emergency prevention division shall be notified before any required acceptance testing.

The conditions of approval of all Halon automatic fire-extinguishing systems shall include (i) a demonstration of need acceptable to the fire chief detailing a critical need for the system such as a direct effect on life safety that cannot be adequately addressed by other types of suppression systems, and (ii) an approved method of testing that does not include the intentional release of Halon gas.

[F]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 (*NFPA 13R sprinkler systems*) shall be permitted in Group I-1 facilities.
2. Where a building being constructed will be within the scope of 903.3.1.3 (*NFPA 13D sprinkler systems*), an automatic sprinkler

1 system installed in accordance with Section 903.3.1.3 (*NFPA 13D*
2 *sprinkler systems*) shall be allowed in Group I-1 facilities when in
3 compliance with all of the following:

4 2.1. A hydraulic design information sign is located on the
5 system riser;

6 2.2. Exception 1 of Section 903.4 (*Sprinkler system*
7 *supervision and alarm*) is not applied; and

8 2.3. Systems shall be maintained in accordance with the
9 requirements of Section 903.3.1.2 (*NFPA 13R sprinkler*
10 *systems*).

11 3. An automatic sprinkler system is not required where day care facilities
12 are at the level of exit discharge and where every room where care is
13 provided has at least one exterior exit door.

14 4. In buildings where Group I-4 day care is provided on levels other than
15 the level of exit discharge, an automatic sprinkler system in
16 accordance with Section 903.3.1.1 (*NFPA 13 sprinkler systems*) shall
17 be installed on the entire floor where care is provided and all floors
18 between the level of care and the level of exit discharge, all floors
19 below the level of exit discharge,.

20 **Exception:** An automatic sprinkler system installed in
21 accordance with Section 903.3.1.2 (*NFPA 13R sprinkler*
22 *systems*) shall be allowed in Group I-1 facilities.

23 **[F]903.3.1.2.1 Balconies and decks.** Sprinkler protection shall be provided for exterior
24 balconies, decks, and ground floor patios of dwelling units where the building is of Type
25 V construction, or of Type III construction if the balcony or deck is framed with wood;
26 provided there is a roof or deck above. Sidewall sprinklers that are used to protect such
27 areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm)
28 to 6 inches (152 mm) below the structural members and a maximum distance of 14
29 inches (356 mm) below the deck of the exterior balconies and decks that are constructed
30 of open wood joist construction.

31 **[F]903.3.1.2.2 Balcony closets.** Sprinkler protection shall be provided for all balcony
32 closets.

33 **[F]903.3.1.3 NFPA 13D sprinkler systems.** Automatic sprinkler systems installed in one
34 and two-family dwellings, Group R-3 and R-4 congregate living facilities with 16 or
35 fewer residents and townhouses shall be permitted to be installed throughout in
36 accordance with NFPA 13D.

1 [F]903.3.5.2 Water supplies designed for automatic sprinkler systems shall provide a
2 safety factor of ten (10) pounds per square inch gauge (PSIG) or ten (10) percent of the
3 minimum required residual pressure, whichever is greater. The safety factor shall be
4 based on the calculated system design flow and pressure.

5 **Exception:** A safety factor less than those defined in this Section may be approved
6 by the fire chief only if historical water supply data is available to demonstrate that
7 reasonable expected fluctuations will not cause the water supply to fall below the
8 system demand.

9 [F]903.3.5.3 **Hose Stream Demand.** The minimum calculated hose stream demand for
10 Type V-B and Type V-A construction, as defined in the Building Code, shall be a
11 minimum of 250 Gallons Per Minute (GPM).

12 [F]903.3.6 **Hose threads.** Fire hose threads and fittings used in connection with
13 automatic sprinkler systems shall be approved and shall be National Standard Hose
14 Thread.

15 [F]903.3.8 **Sprinkler System Flex Piping.** Flex piping used in automatic sprinkler
16 systems shall be limited in length to a maximum of 6 feet. The extinguishing agent shall
17 pass through a maximum of one 6 foot section before discharging from the sprinkler
18 orifice (head). Approval of shop drawing submittals shall be required for all uses of flex
19 sprinkler piping and where more than one (1) flex piping sprinkler drop is used in a
20 remodel application the adequacy of the water supply shall be verified by hydraulic
21 calculations.

22 [F]904.9 **Halon systems.** Halogenated extinguishing systems shall be installed,
23 maintained, and periodically inspected and tested in accordance with NFPA 12A and
24 their listing. The conditions of approval of all Halon automatic fire-extinguishing
25 systems shall include (i) a demonstration of need acceptable to the fire chief detailing a
26 critical need for the system such as a direct effect on life safety that cannot be adequately
27 addressed by other types of suppression systems, and (ii) an approved method of testing
28 that does not include the intentional release of Halon gas.

29 [F]904.11 **Commercial cooking systems.** The automatic fire-extinguishing system for
30 commercial cooking systems shall be of a type recognized for protection of commercial
31 cooking equipment and exhaust systems of the type and arrangement protected. Each pre-
32 engineered automatic dry- and wet-chemical extinguishing system shall be tested in
33 accordance with UL 300 and listed and labeled for its intended application. Other types
34 of extinguishing systems shall be listed and labeled for specific use as protection for
35 commercial cooking operations. The system shall be installed in accordance with this
36 code, its listing and the manufacturer's installation instructions. Automatic fire
37 suppression systems of the following types shall be installed in accordance with the
38 referenced standard indicated, as follows:

1. Carbon-dioxide extinguishing systems, NFPA 12.
2. Automatic sprinkler system, 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 1: Factory-built commercial cooking recirculating systems that are tested in accordance with UL 710B, and listed and installed in accordance with Section 304.1 (*General*) of the International Mechanical Code.

Exception 2: With the concurrence of the building official, commercial cooking equipment used intermittently for periods which total less than 6 hours per week may be served by a Type II ventilation hood without fixed fire suppression. A portable fire extinguisher rated for commercial cooking applications shall be provided.

[F]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 new fire standpipe systems shall be approved and shall be National Standard Hose Thread. Except as otherwise approved by the fire chief, existing standpipe fire hose threads shall be national standard hose thread. The location of fire department hose connections shall be approved. In buildings used for high-piled combustible storage, fire protection shall be in accordance with Chapter 32 (*High-piled Combustible Storage*) of the International Fire Code.

[F]905.1.1 Hose. With the concurrence of the Building official, hoses need not be installed or maintained on standpipes of any class when the occupancy does not provide training in the use of standpipe hose and the employees, residents, or other regular occupants of the occupancy are trained/instructed to evacuate and evacuation drills are conducted at intervals agreed on by the owner/agent and the Fire Department.

[F]905.3.1 Building height. Class III standpipe systems shall be installed throughout buildings where the floor level of the highest story is located more than 30 feet (9,144 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 (9144mm) 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 (*NFPA 13 sprinkler systems*) or 903.3.1.2 (*NFPA 13R sprinkler systems*).

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 additional hose connections are located as required for Class II standpipes in accordance with Section 905.5 (*Location of Class II standpipe hose connections*).
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.

[F]905.3.4.1 Hose and cabinet. If hose is installed, the 1½-inch (38 mm) hose connections shall be equipped with sufficient lengths of 1½-inch (38 mm) hose to provide fire protection for the stage area. Hose connections shall be equipped with an approved adjustable fog nozzle and be mounted in a cabinet or on a rack.

[F]905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required stairway, a hose connection shall be provided for each floor level above or below grade. Hose connections shall be located at an intermediate floor level landing between floors, unless otherwise approved by the fire code official.
2. On each side of the wall adjacent to the exit opening of a horizontal exit.

Exception: Where floor areas adjacent to a horizontal exit are reachable from exit stairway hose connections by a 30-foot (9,144 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 (9,144 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. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line 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), a hose connection shall be located to serve the roof or at the highest landing of a stairway with stair access to the roof provided in accordance with Section 1009.16 (*Stairway to roof*). An additional hose connection shall be provided at the top of the most hydraulically remote standpipe for testing purposes.
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45,720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60,960 mm) from a hose connection, the fire code official is authorized to require that additional hose connections be provided in approved locations.

[F]905.5.3 Class II system hose. If installed, the minimum diameter for standpipe hose shall be 1½ inches (38 mm) and the hose shall be listed for this service.

[F]906.1 Where required. Portable fire extinguishers shall be installed in the following locations. Before the installation of Halon fire extinguishers in new occupancies or processes, the applicant must submit a demonstration of need acceptable to the chief detailing a critical need for this type of extinguisher such as a direct effect on life safety that cannot be adequately addressed by other types of extinguishing agents.

1. In all Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.
Exception: In all Group 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 (9,144 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 3315.1 (*Where required*) of the International Fire Code.

5. Where required by the sections indicated in Table 906.1 (*Additional Required Portable Fire Extinguisher*) in the International Fire Code.

6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the fire chief.

[F]907.2 Where required—new buildings and structures. An approved manual, automatic or manual and automatic fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 (*Group A*) through 907.2.23 (*Battery rooms*) and provide occupant notification in accordance with Section 907.6 (*Installation*), unless other requirements are provided by another section of this code. The fire alarm control panel or a full function remote annunciator shall be installed at the main entrance for use by fire department personnel.

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 water-flow detection devices. The automatic fire detectors shall be smoke detectors. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed. The manual fire alarm box is required to provide a means for fire watch personnel to initiate an alarm during a sprinkler system impairment event. The manual fire alarm box may be located in an area that is accessible to the public.

Exceptions:

1. The manual fire alarm box is not required for fire alarm systems dedicated to elevator recall control and supervisory service.
2. Automatic heat detection required by this section shall not be required if automatic sprinkler protection installed in accordance with Section 903.3.1.1 (*NFPA 13 sprinkler systems*) or 903.3.1.2 (*NFPA 13R sprinkler systems*) is provided and connected to the building fire alarm system.
3. Where ambient conditions prohibit installation of automatic smoke detection, other automatic fire detection shall be allowed.

[F]907.2.1.3 Electrical Shunt for Amplified Sound Conditions. For venues with amplified music or sound systems, in Group A occupancies having an occupant load of 300 or more, electrical shunts shall be provided to de-energize the music or sound systems upon alarm activation as necessary to demonstrate compliance with the audibility requirements of NFPA 72.

[F]907.2.3.1. Common Areas Within Day Care and Child Care Facility Occupancies. These occupancies shall be provided a fire alarm system per IFC

Amendment Section 907.2.6.4 (*Common Areas within Day Care Occupancies*), in addition to the requirements of 907.2.3 (*Group E*).

[F]907.2.6.4 Common Areas within Day Care Occupancies. Day care occupancies shall be protected by a fire alarm system which monitors smoke detectors installed in accordance with this section, the listing of the detectors and NFPA 72. Detectors must be placed on each story in front of doors to the stairways and at no greater spacing than the detector's listed spacing in the corridors of all floors containing the day care facility. Detectors must also be installed in lounges, recreation areas and sleeping rooms in the day care occupancy and as required by the Building Code. Alarms shall be visible and audible throughout the day care facility.

Exceptions:

1. Day cares housed within a single room.
2. A Group E day care housed within and serving the students of an E occupancy, such as an after school program, summer program, or similar function, are permitted to comply with the alarm and detection requirements of section 907.2.3 (*Group E*).
3. Day cares serving less than 12 children when operated within the single family residence of the day care operator, provided that the dwelling is protected with interconnected hard wired smoke alarms located as required by this section and powered as required for a new home in accordance with the International Residential Code and NFPA 72. When such residential day cares serve hearing impaired children, parents, or guardians, the interconnected single station smoke alarms shall be listed for visual alarm service.
4. Single story day care occupancies serving 30 or fewer children with multiple remote at grade exits as defined by the Building Code may be provided with a smoke detection system complying with the State of Texas licensing standards provided that the operation of any detection device will cause the operation of an alarm device within every area listed above. When such small day cares serve hearing impaired children, parents, or guardians, the alarm signals shall be produced by devices listed for visual alarm service.

[F]907.2.7 Group M.

A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 (*Installation*) 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 (*Covered Mall and Open Mall Buildings*).
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 (*NFPA 13 sprinkler systems*) and the occupant notification appliances will automatically activate throughout the notification zones upon sprinkler water flow.
3. Duct smoke detectors installed in separate lease spaces of large shell buildings need not be connected to monitoring panels where the only fire alarm system installed in the building is the required monitoring for a fire sprinkler system and the sprinkler monitoring system is located inside a different lease space.

[F]907.2.8.1 Manual fire alarm system. A manual fire alarm system shall be installed in Group R-1 occupancies.

Exceptions:

1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each individual sleeping unit has an exit directly to a public way, exit court or yard.
2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:
 - 2.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 (*NFPA 13 sprinkler systems*) or 903.3.1.2 (*NFPA 13R sprinkler systems*).
 - 2.2. The notification appliances will activate upon sprinkler water flow; and
 - 2.3. At least one manual fire alarm box is installed at an approved location.

3. Audibility requirements shall not be applicable on balconies less than 100 square feet in area, or on balconies where the least dimension is 5' or less.

[F]907.2.8.2 Automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.6 (*Installation*) shall be installed throughout all group R-1 occupancies. Listed system-type automatic detectors shall be installed within interior corridors serving sleeping units and within furnace rooms and common areas such as, recreational rooms, laundry rooms, and similar areas served by such interior corridors providing access to and egress from sleeping units.

Exception: An automatic smoke detection system is not required in buildings that do not have interior corridors serving sleeping units, 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, and where recreational rooms, laundry rooms, furnace rooms, and similar areas are not located within or along the egress paths from sleeping units.

[F]907.2.9 Group R-2. Fire alarm systems and smoke alarms shall be installed in Group R-2 occupancies as required in Section 907.2.9.1 (*Manual and automatic fire alarm system*) and 907.2.9.2 (*Smoke alarms*).

[F]907.2.9.1 Manual and automatic fire alarm system. A manual and automatic fire alarm system that activates the occupant notification system in accordance with 907.6 (*Installation*) 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.

Listed system-type automatic detectors shall be installed within furnace rooms and common areas such as recreational rooms, laundry rooms, interior corridors serving as the primary access and egress for dwelling units, and similar areas.

Exceptions:

1. A fire alarm system is not required in buildings not more than two stories in height where all dwelling units or sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, exit court or yard.

2. Manual fire alarm boxes are not required throughout the building when all the following conditions are met:
 - 2.1. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 (*NFPA 13 sprinkler systems*) or Section 903.3.1.2 (*NFPA 13R sprinkler systems*);
 - 2.2. The notification appliances will automatically activate throughout the notification zones upon sprinkler water flow; and
 - 2.3. At least one manual fire alarm box is installed at an approved location.
3. A separate 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 903.3.1.1 (*NFPA 13 sprinkler systems*) or 903.3.1.2 (*NFPA 13R sprinkler systems*), provided that sprinkler system activation results in a local alarm designed to notify all occupants and dwelling units have a means of egress door opening directly to an exterior exit access that leads directly to the exists or are served by open ended corridors designed in accordance with Section 1026.6 (*Exterior stairway and ramp protection*), exception 4.
4. Audibility requirements shall not be applicable on balconies less than 100 square feet in area, or on balconies where the least dimension is 5' or less.

[F]907.2.9.2 Smoke alarms. Single- and multiple-station smoke alarms shall be installed in accordance with section 907.2.11 (*Single- and multiple-station smoke alarms*).

[F]907.2.13.2 Fire department wired communications system. An approved two-way, fire department wired communication system designed and installed in accordance with NFPA 72 shall be provided for fire department use. It shall operate between a fire command center complying with Section 508 (*Fire Command Center*) of the International Fire Code and elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside enclosed exit stairways. The fire department communication device shall be provided at each floor level within the enclosed exit stairway.

[F]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 automatic smoke detection, a heat detector shall be permitted.
2. The smoke detector shall not be required at the location of notification appliance circuit power extenders where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 (*NFPA 13 sprinkler systems*) or 903.3.1.2 (*NFPA 13R sprinkler systems*).

[F]907.6.5 Monitoring. Fire alarm systems required by this chapter or by the International Building Code shall be monitored by an approved supervising station in accordance with NFPA 72, or by a local alarm which gives audible and visual signals at a constantly attended location. Reporting procedures and personnel training records for local alarm systems monitored at a constantly attended location shall be maintained for review and approval by the Fire Department.

Exception: Supervisory service is not required for:

1. Single-station and multiple-station smoke alarms required by Section 907.2.11 (*Single- and multiple-station smoke alarms*).
2. Automatic sprinkler systems in one- and two-family dwellings.

[F]907.6.6 Annunciation and control. The main fire alarm control panel or a full function remote annunciator shall be installed at the main entrance or at an approved location near the main entrance of buildings with fire alarm systems.

SECTION 909 SMOKE CONTROL SYSTEMS

[F]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 (*Smoke and Heat Removal*). Mechanical smoke control systems shall not be considered exhaust systems under Chapter 5 (*Exhaust Systems*) of the International Mechanical Code.

[F]909.2 General design requirements. Buildings, structures, or parts thereof required by this code to have a smoke control system or systems shall have such systems designed in accordance with the applicable requirements of Section 909 (*Smoke Control Systems*).

1 and the generally accepted and well- established principles of engineering relevant to the
2 design. The construction documents shall include sufficient information and detail to
3 adequately describe the elements of the design necessary for the proper implementation
4 of the smoke control systems. These documents shall be accompanied by sufficient
5 information and analysis to demonstrate compliance with these provisions.
6

7 **[F]909.3 Special inspection and test requirements.** In addition to the ordinary
8 inspection and test requirements which buildings, structures, and parts thereof are
9 required to undergo, smoke control systems subject to the provisions of Section 909
10 (*Smoke Control Systems*) shall undergo special inspections and tests sufficient to verify
11 the proper commissioning of the smoke control design in its final installed condition.
12 The design submission accompanying the construction documents shall clearly detail
13 procedures and methods to be used and the items subject to such inspections and tests.
14 Such commissioning shall be in accordance with generally accepted engineering practice
15 and, where possible, based on published standards for the particular testing involved.
16 The special inspections and tests required by this section shall be conducted under the
17 same terms in Section 1704 (*Special Inspections, Contractor Responsibility and*
18 *Structural Observations*).
19

20 **[F]909.4 Analysis.** A rational analysis supporting the types of smoke control systems to
21 be employed, their methods of operation, the systems supporting them and the methods
22 of construction to be utilized shall accompany the submitted construction documents and
23 shall include, but not be limited to, the items indicated in Sections 909.4.1 (*Stack effect*)
24 through 909.4.6 (*Duration of operation*).
25

26 **[F]909.4.1 Stack effect.** The system shall be designed such that the maximum probable
27 normal or reverse stack effect will not adversely interfere with the system's capabilities.
28 In determining the maximum probable stack effect, altitude, elevation, weather history,
29 and interior temperatures shall be used.
30

31 **[F]909.4.2 Temperature effect of fire.** Buoyancy and expansion caused by the design
32 fire in accordance with Section 909.9 (*Design Fire*) shall be analyzed. The system shall
33 be designed such that these effects do not adversely interfere with the system's
34 capabilities.
35

36 **[F]909.4.3 Wind effect.** The design shall consider the adverse effects of wind,
37 consistent with the wind-loading provisions of Chapter 16 (*Structural Design*).
38

39 **[F]909.4.4 HVAC systems.** The design shall consider the effects of the heating,
40 ventilating, and air- conditioning (HVAC) systems on both smoke and fire transport. The

analysis shall include all permutations of systems status. The design shall consider the effects of the fire on the HVAC systems.

[F]909.4.5 Climate. The design shall consider the effects of low temperatures on systems, property, and occupants. Air inlets and exhausts shall be located so as to prevent snow or ice blockage.

[F]909.4.6 Duration of operation. All portions of active or passive smoke control systems shall be capable of continued operation after detection of the fire event for not less than 20 minutes.

[F]909.5 Smoke barrier construction. Smoke barriers shall comply with Section 710 (*Smoke Partitions*), 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. Interior exit stairways and ramps and exit passageways: $A/A_w = 0.00035$
3. Enclosed exit access stairways and ramps and all other shafts: $A/A_w = 0.00150$
4. Floors and roofs: $A/A_F = 0.00050$

where:

A= Total leakage area, square feet (m²).

A_F=Unit floor or roof area of barrier, square feet (m²).

A_w=Unit wall area of barrier, square feet (m²).

The leakage area ratios shown do not include openings due to doors, operable windows, or similar gaps. These shall be included in calculating the total leakage area.

[F]909.5.1 Leakage area. The total leakage area of the barrier is the product of the smoke barrier gross area monitored 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.

1 **[F]909.5.2 Opening protection.** Openings in smoke barriers shall be protected by
2 automatic-closing devices actuated by the required controls for the mechanical smoke
3 control system. Door openings shall be protected by door assemblies complying with
4 Section 716.5.3 (*Door assemblies in corridors and smoke barriers*).
5

6 **Exceptions:**

- 7
- 8 1. Passive smoke control systems with automatic-closing devices actuated by spot-
9 type smoke detectors listed for releasing service installed in accordance with
10 Section 907.3 (*Fire safety functions*).
 - 11 2. Fixed openings between smoke zones that are protected utilizing the airflow
12 method.
 - 13 3. In Group I-2, where such doors are installed across corridors, a pair of opposite-
14 swinging doors without a center mullion shall be installed having vision panels
15 with approved fire-rated glazing materials in approved fire-rated frames, the
16 area of which shall not exceed that tested. The doors shall be close fitting
17 within operational tolerances and shall not have undercuts, louvers, or grilles.
18 The doors shall have head and jamb stops, astragals or rabbets at meeting edges
19 and shall be automatic-closing by smoke detection in accordance with Section
20 716.5.9.3 (*Smoke-activated doors*). Positive-latching devices are not required.
 - 21 4. Group I-3.
 - 22 5. Openings between smoke zones with clear ceiling heights of 14 feet (4267 mm)
23 or greater and bank-down capacity of greater than 20 minutes as determined
24 by the design fire size.
25

26 **[F]909.5.2.1 Ducts and air transfer openings.** Ducts and air transfer openings are
27 required to be protected with a minimum Class II, 250° F (121° C) smoke damper
28 complying with Section 717 (*Ducts and Air Transfer Openings*).
29

30 **[F]909.6 Pressurization method.** The primary mechanical means of controlling smoke
31 shall be by pressure differences across smoke barriers. Maintenance of a tenable
32 environment is not required in the smoke control zone of fire origin.
33

34 **[F]909.6.1 Minimum pressure difference.** The minimum pressure difference across a
35 smoke barrier shall be 0.05 inch water gage (0.0124 kPa) in fully sprinklered buildings.
36 In buildings permitted to be less than fully sprinklered, the smoke control system shall be
37 designed to achieve pressure differences at least two times the maximum calculated
38 pressure difference produced by the design fire.
39

40 **[F]909.6.2 Maximum pressure difference.** The maximum air pressure difference
41 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 1008.1.3 (*Door opening force*). Opening and closing forces for other doors shall be determined by standard engineering methods for the resolution of forces and reactions. The calculated force to set a side-hinged, swinging door in motion shall be determined by:

$$F = F_{dc} + K(WA\Delta P)/2(W - d) \quad \text{(Equation 9-1)}$$

where:

A=Door area, square feet (m²).

d= Distance from door handle to latch edge of door, feet (m).

F=Total door opening force, pounds (N).

F_{dc}=Force required to overcome closing device, pounds (N).

K= Coefficient 5.2 (1.0).

W= Door width, feet (m).

ΔP= Design pressure difference, inches of water (Pa).

[F]909.7 Airflow design method. When approved by the fire code official, smoke migration through openings fixed in a permanently open position, which are located between smoke control zones by the use of the airflow method, shall be permitted. The design airflow shall be in accordance with this section. Airflow shall be directed to limit smoke migration from the fire zone. The geometry of openings shall be considered to prevent flow reversal from turbulent effects.

[F]909.7.1 Velocity. The minimum average velocity through a fixed opening shall not be less than:

$$v = 217.2 [h (T_f - T_o)/(T_f + 460)]^{1/2} \quad \text{(Equation 9-2)}$$

For SI: $v = 119.9 [h (T_f - T_o)/T_f]^{1/2}$

where:

h= Height of opening, feet (m).

1
2 T_f = Temperature of smoke, °F (°K).

3
4 T_o = Temperature of ambient air, °F (°K).

5
6 v = Air velocity, feet per minute (m/minute).

7
8 **[F]909.7.2 Prohibited conditions.** The airflow design method shall not be employed
9 where either the quantity of air or the velocity of the airflow will adversely affect other
10 portions of the smoke control system, unduly intensify the fire, disrupt plume dynamics
11 or interfere with exiting. In no case shall airflow toward the fire exceed 200 feet per
12 minute (1.02 m/s). Where the formula in Section 909.7.1 (*Velocity*) requires airflow to
13 exceed this limit, the airflow method shall not be used.

14
15 **[F]909.8 Exhaust method.** When approved by the fire code official, mechanical smoke
16 control for large enclosed volumes, such as in atriums or malls shall be permitted to use
17 the exhaust method. Smoke control systems using the exhaust method shall be designed
18 in accordance with NFPA 92.

19
20 **[F]909.8.1 Exhaust rate.** The height of the lowest horizontal surface of the smoke layer
21 interface shall be maintained at least 6 feet (1,829 mm) above any walking surface that
22 forms a portion of a required egress system within the smoke zone. The required exhaust
23 rate for the zone shall be the largest of the calculated plume mass flow rates for the
24 possible plume configurations. Provisions shall be made for natural or mechanical
25 supply of air from outside or adjacent smoke zones to make up for the air exhausted. It is
26 recommended that a makeup airflow rate of not greater than 90 percent of the exhaust
27 rate be provided. Makeup airflow rates, when measured at the potential fire location,
28 shall not exceed 200 feet per minute (60,960 mm per minute) toward the fire. The
29 temperature of the makeup air shall be such that it does not expose temperature-sensitive
30 fire protection systems beyond their limits.

31
32 **[F]909.9 Design fire.** The design fire shall be based on a Q of not less than 5,000 Btu/s
33 (5,275 kW) unless a rational analysis is performed by the registered design professional
34 and approved by the fire code official. The design fire shall be based on the analysis in
35 accordance with Section 909.4.1 (*Analysis*) and this section.

36
37 **[F]909.9.1 Factors considered.** The engineering analysis shall include the
38 characteristics of the fuel, fuel load, effects included by the fire, and whether the fire is
39 likely to be steady or unsteady.
40

1 [F]909.9.2 **Design fire fuel.** Determination of the design fire shall include consideration
2 of the type of fuel, fuel spacing, and configuration.

3
4 [F]909.9.3 **Heat-release assumptions.** The analysis shall make use of best available
5 data from approved sources and shall not be based on excessively stringent limitations of
6 combustible material.

7
8 [F]909.9.4 **Sprinkler effectiveness assumptions.** A documented engineering analysis
9 shall be provided for conditions that assume fire growth is halted at the time of sprinkler
10 activation.

11
12 [F]909.10 **Equipment.** Equipment such as, but not limited to, fans, ducts, automatic
13 dampers and balance dampers, shall be suitable for its intended use, suitable for the
14 probable exposure temperatures that the rational analysis indicates, and as approved by
15 the fire code official.

16
17 [F]909.10.1 **Exhaust fans.** Components of exhaust fans shall be rated and certified by
18 the manufacturer for the probable temperature rise to which the components will be
19 exposed. This temperature rise shall be computed by:

20
21
$$T_s = (Q_c/m_c) + (T_a) \quad \text{(Equation 9-3)}$$

22
23 where:

24
25 c = Specific heat of smoke at smoke layer temperature, Btu/lb °F (kJ/kg·K).

26
27 m = Exhaust rate, pounds per second (kg/s).

28
29 Q_c = Convective heat output of fire, Btu/s (kW).

30
31 T_a = Ambient temperature, °F (°K).

32
33 T_s =Smoke temperature, °F (°K).

34
35 **Exception:** Reduced T_s as calculated based on the assurance of adequate dilution air.

36
37 [F]909.10.2 **Ducts.** Duct materials and joints shall be capable of withstanding the
38 probable temperatures and pressures to which they are exposed as determined in
39 accordance with Section 909.10.1 (*Exhaust fans*). Ducts shall be constructed and
40 supported in accordance with the International Mechanical Code. Ducts shall be leak
41 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 International Mechanical Code, that are constructed of approved fire-resistance-rated materials.

[F]909.10.3. Equipment, inlets and outlets. Equipment shall be located to not expose uninvolved portions of the building to an additional fire hazard. Outside air inlets shall be located to minimize the potential for introducing smoke or flame into the building. Exhaust outlets shall be located to minimize reintroduction of smoke into the building and to limit exposure of the building or adjacent buildings to an additional fire hazard.

[F]909.10.4 Automatic dampers. Automatic dampers, regardless of the purpose for which they are installed within the smoke control system, shall be listed and conform to the requirements of approved, recognized standards.

[F]909.10.5 Fans. In addition to other requirements, belt-driven fans shall have 1.5 times the number of belts required for the design duty, with the minimum number of belts being two. Fans shall be selected for stable performance based on normal temperature and, where applicable, elevated temperature. Calculations and manufacturer's fan curves shall be part of the documentation procedures. Fans shall be supported and restrained by noncombustible devices in accordance with the requirements of Chapter 16 (Structural Design). 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.

[F]909.11 Power systems. The smoke control system shall be supplied with two sources of power. Primary power shall be the normal building power systems. Secondary power shall be from an approved standby source complying with Chapter 27 (*Electrical*) of this code. The standby power source and its transfer switches shall be in a room separate from the normal power transformers and switch gear 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 (*Fire Barriers*) or horizontal assemblies constructed in accordance with Section 711 (*Horizontal Assemblies*), or both. The transfer to full standby power shall be automatic and within 60 seconds of failure of the primary power.

1 **[F]909.11.1 Power sources and power surges.** Elements of the smoke control system
2 relying on volatile memories or the like shall be supplied with uninterruptible power
3 sources of sufficient duration to span a 15-minute primary power interruption. Elements
4 of the smoke control system susceptible to power surges shall be suitably protected by
5 conditioners, suppressors or other approved means.
6

7 **[F]909.12 Detection and control systems.** Fire detection systems providing control
8 input or output signals to mechanical smoke control systems or elements thereof shall
9 comply with the requirements of Section 907 (*Fire Alarm and Detection Systems*). Such
10 systems shall be equipped with a control unit complying with UL 864 and listed as smoke
11 control equipment. Control systems for mechanical smoke control systems shall include
12 provisions for verification. Verification shall include positive confirmation of actuation,
13 testing, manual override, the presence of power downstream of all disconnects and,
14 through a preprogrammed weekly test sequence, report abnormal conditions audibly,
15 visually and by printed report.
16

17 **[F]909.12.1 Wiring.** In addition to meeting requirements of the National Electrical
18 Code, all wiring, regardless of voltage, shall be fully enclosed within continuous
19 raceways.
20

21 **[F]909.12.2 Activation.** Smoke control systems shall be activated in accordance with
22 this section.
23

24 **[F]909.12.2.1 Pressurization, airflow or exhaust method.** Mechanical smoke control
25 systems using the pressurization, airflow or exhaust method shall have completely
26 automatic control.
27

28 **[F]909.12.2.2 Passive method.** Passive smoke control systems actuated by approved
29 spot-type detectors listed for releasing service shall be permitted.
30

31 **[F]909.12.3 Automatic control.** Where completely automatic control is required or
32 used, the automatic control sequences shall be initiated from: an appropriately zoned
33 automatic sprinkler system complying with Section 903.3.1.1 (*NFPA 13 sprinkler*
34 *systems*), manual controls that are readily accessible to the fire department, and any
35 smoke detectors required by engineering analysis.
36

37 **[F]909.13 Control air tubing.** Control air tubing shall be of sufficient size to meet the
38 required response times. Tubing shall be flushed clean and dry prior to final connections
39 and shall be adequately supported and protected from damage. Tubing passing through
40 concrete or masonry shall be sleeved and protected from abrasion and electrolytic action.
41

1 **[F]909.13.1 Materials.** Control air tubing shall be hard drawn copper, Type L, ACR in
2 accordance with ASTM B 42, ASTM B 43, ASTM B 68, ASTM B 88, ASTM B 251 and
3 ASTM B 280. Fittings shall be wrought copper or brass, solder type, in accordance with
4 ASME B 16.18 or ASME B 16.22. Changes in direction shall be made with appropriate
5 tool bends. Brass compression-type fittings shall be used at final connection to devices;
6 other joints shall be brazed using a BCuP5 brazing alloy with solidus above 1,100° F
7 (593° C) and liquids below 1,500° F (816° C). Brazing flux shall be used on copper-to-
8 brass joints only.

9
10 **Exception:** Nonmetallic tubing used within control panels and at the final connection to
11 devices, providing all of the following conditions are met:

- 12
13 1. Combustible pneumatic tubing exposed within a plenum shall have a peak optical
14 density not greater than 0.50, an average optical density not greater than 0.15, and a
15 flame spread of not greater than 5 feet (1,524 mm) when tested in accordance with
16 UL 1820. Combustible pneumatic tubing shall be listed and labeled.
- 17
18 2. Tubing and connected devices shall be completely enclosed within a galvanized or
19 paint-grade steel enclosure of not less than 0.0296 inch (0.7534 mm) (No. 22 gage).
20 Entry to the enclosure shall be by copper tubing with a protective grommet of
21 neoprene or teflon or by suitable brass compression to male-barbed adapter.
- 22
23 3. Tubing shall be identified by appropriately documented coding.
- 24
25 4. Tubing shall be neatly tied and supported within the enclosure. Tubing bridging
26 cabinet and door or moveable devices shall be of sufficient length to avoid tension
27 and excessive stress. Tubing shall be protected against abrasion. Tubing serving
28 devices on doors shall be fastened along hinges.
- 29

30 **[F]909.13.2 Isolation from other functions.** Control tubing serving other than smoke
31 control functions shall be isolated by automatic isolation valves or shall be an
32 independent system.

33
34 **[F]909.13.3 Testing.** Control air tubing shall be tested at three times the operating
35 pressure for not less than 30 minutes without any noticeable loss in gauge pressure prior
36 to final connection to devices.

37
38 **[F]909.14 Marking and identification.** The detection and control systems shall be
39 clearly marked at all junctions, accesses and terminations.
40

1 **[F]909.15 Control diagrams.** Identical control diagrams showing all devices in the
2 system and identifying their location and function shall be maintained current and kept on
3 file with the fire code official, the fire department and in the fire command center in a
4 format and manner approved by the fire chief.
5

6 **[F]909.16 Fire-fighter's smoke control panel.** A fire-fighter's smoke control panel for
7 fire department emergency response purposes only shall be provided and shall include
8 manual control or override of automatic control for mechanical smoke control systems.
9 The panel shall be located in a fire command center complying with Section 911 (*Fire*
10 *Command Center*), and shall comply with Sections 909.16.1 (*Smoke control systems*)
11 through 909.16.3 (*Control action and priorities*). The fire-fighter's smoke control panel
12 shall be designed to graphically depict the physical building arrangement, smoke-control
13 systems and equipment, and the areas of the building served by the equipment. Consult
14 the fire department engineering section for details on the control panel design.
15

16 **[F]909.16.1 Smoke control systems.** Fans within the building shall be shown on the
17 fire-fighter's control panel. A clear indication of the direction of airflow and the
18 relationship of components shall be displayed. Status indicators shall be provided for all
19 smoke control equipment, annunciated by fan and zone, and by pilot-lamp type indicators
20 as follows:
21

- 22 1. Fans, dampers and other operating equipment in their normal status—WHITE.
- 23
- 24 2. Fans, dampers and other operating equipment in their off or closed status—RED.
- 25
- 26 3. Fans, dampers and other operating equipment in their on or open status—
- 27 GREEN.
- 28
- 29 4. Fans, dampers and other operating equipment in a fault status—YELLOW/
- 30 AMBER.
- 31

32 The pilot-lamp type status indicators shall be located adjacent to the graphic symbol of
33 the smoke control equipment that they serve.
34

35 **[F]909.16.2 Smoke control panel.** The fire-fighter's control panel shall provide control
36 capability over the complete smoke-control system equipment within the building as
37 follows:
38

- 39 1. ON-AUTO-OFF control over each individual piece of operating smoke control
40 equipment that can also be controlled from other sources within the building.
41 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 by the fire code official, 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 by the fire code official, where the control is accomplished by computer interface using approved, plain English commands.

[F]909.16.3 Control action and priorities. The fire-fighter's control panel actions shall be as follows:

1. ON-OFF, OPEN-CLOSE control actions shall have the highest priority of any control point within the building. Once issued from the fire-fighter's control panel, no automatic or manual control from any other control point within the building shall contradict the control action. Where automatic means are provided to interrupt normal, non-emergency equipment operation or produce a specific result to safeguard the building or equipment (i.e., duct freeze-stats, 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 the National Electrical Code.

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, non-emergency, 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

1 emergency condition for that device or group of devices within the zone. In no
2 case shall control actions require the smoke control system to assume more than
3 one configuration at any one time.
4

5 **[F]909.17 System response time.** Smoke-control system activation shall be initiated
6 immediately after receipt of an appropriate automatic or manual activation command.
7 Smoke control systems shall activate individual components (such as dampers and fans)
8 in the sequence necessary to prevent physical damage to the fans, dampers, ducts and
9 other equipment. For purposes of smoke control, the fire-fighter's control panel response
10 time shall be the same for automatic or manual smoke control action initiated from any
11 other building control point. The total response time, including that necessary for
12 detection, shutdown of operating equipment, and smoke control system startup, shall
13 allow for full operational mode to be achieved before the conditions in the space exceed
14 the design smoke condition. The system response time for each component and their
15 sequential relationships shall be detailed in the required rational analysis and verification
16 of their installed condition reported in the required final report.
17

18 **[F]909.18 Acceptance testing.** Devices, equipment, components and sequences shall be
19 individually tested. These tests, in addition to those required by other provisions of this
20 code, shall consist of determination of function, sequence and, where applicable, capacity
21 of their installed condition.
22

23 **[F]909.18.1 Detection devices.** Smoke or fire detectors that are a part of a smoke
24 control system shall be tested in accordance with Chapter 9 (*Fire Protection Systems*) in
25 their installed condition. When applicable, this testing shall include verification of
26 airflow in both minimum and maximum conditions.
27

28 **[F]909.18.2 Ducts.** Ducts that are part of a smoke control system shall be traversed
29 using generally accepted practices to determine actual air quantities.
30

31 **[F]909.18.3 Dampers.** Dampers shall be tested for function in their installed condition.
32

33 **[F]909.18.4 Inlets and outlets.** Inlets and outlets shall be read using generally accepted
34 practices to determine air quantities.
35

36 **[F]909.18.5 Fans.** Fans shall be examined for correct rotation. Measurements of
37 voltage, amperage, revolutions per minute (rpm) and belt tension shall be made.
38

39 **[F]909.18.6 Smoke barriers.** Measurements using inclined manometers or other
40 approved calibrated measuring devices shall be made of the pressure differences across

1 smoke barriers. The measurements shall be conducted for each possible smoke control
2 condition.

3
4 **[F]909.18.7 Controls.** Each smoke zone, equipped with an automatic-initiation device,
5 shall be put into operation by the actuation of one such device. Each additional device
6 within the zone shall be verified to cause the same sequence without requiring the
7 operation of fan motors in order to prevent damage. Control sequences shall be verified
8 throughout the system, including verification of override from the fire-fighter's control
9 panel and simulation of standby power conditions.

10
11 **[F]909.18.8 Special inspections for smoke control.** Smoke control systems shall be
12 tested by a special inspection agency that has been preapproved by the fire department
13 engineering section. The special inspection agency must be hired directly by the building
14 owner and shall not be a sub-contractor to one of the trades.

15
16 **[F]909.18.8.1 Scope of testing.** Special inspections shall be conducted in accordance
17 with the following:

- 18
19 1. During erection of ductwork and prior to concealment for the purposes of leakage
20 testing and recording of device location.
21
22 2. Prior to occupancy and after sufficient completion for the purposes of pressure-
23 difference testing, flow measurements, and detection and control verification.
24

25 **[F]909.18.8.2 Qualifications.** Special inspection agencies for smoke control shall have
26 expertise in fire protection engineering, mechanical engineering and certification as air
27 balancers.

28
29 **[F]909.18.8.3 Reports.** A complete report of testing shall be prepared by the special
30 inspection agency. The report shall include identification of all devices by manufacturer,
31 nameplate data, design values, measured values, and identification tag or mark. The
32 special inspection agency shall provide their NEBB or AABC accreditation seal, sign,
33 and date the report. The report shall be reviewed by the responsible registered design
34 professional and, when satisfied that the design intent has been achieved, the responsible
35 registered design professional shall seal, sign and date the report.

36
37 **[F]909.18.8.3.1 Report filing.** A copy of the final report shall be filed with the fire code
38 official and an identical copy shall be maintained in an approved location at the building.
39

40 **[F]909.18.9 Identification and documentation.** Charts, drawings and other documents
41 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 (*Reports*). Devices shall have an approved identifying tag or mark on them consistent with the other required documentation and shall be dated indicating the last time they were successfully tested and by whom.

[F]909.19 System acceptance. Buildings, or portions thereof, required by this code to comply with this section shall not be issued a certificate of occupancy until such time that the fire code official determines that the provisions of this section have been fully complied with, and that the fire department has received satisfactory instruction on the operation, both automatic and manual, of the system.

Exception: In buildings of phased construction, a temporary certificate of occupancy, as approved by the fire code official, shall be permitted; 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.

[F]909.20 Smokeproof enclosures. Where required by Section 1022.10 (*Smokeproof enclosures and pressurized stairways and ramps*), a smokeproof enclosure shall be constructed in accordance with this section. A smokeproof enclosure shall consist of a pressurized enclosed exit stairway that conforms to Section 1022.1 (*General*) and Section 1022.2 (*Construction*) and a pressurized vestibule meeting the requirements of this section. Design of pressurization systems shall be in accordance with Section 909 (*Smoke Control Systems*).

[F]909.20.1 Access. Access to the stair shall be by way of a vestibule. 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 and shall not have a length of less than 72 inches in the direction of egress travel. Refer to Section 1007.6 (*Areas of refuge*) for area of rescue assistance.

[F]909.20.2 Construction. The smokeproof enclosure shall be separated from the remainder of the building by not less than a 2-hour fire-resistance-rated fire barrier without openings other than the required means of egress doors. The vestibule shall be separated from the stairway by not less than a 2-hour fire-resistance-rated fire barrier.

[F]909.20.2.1 Door closers. Doors in smokeproof enclosures shall be self-closing.

[F]909.20.3.1 Vestibule doors. The door assembly from the building into the vestibule shall be a fire door complying with Section 716.5 (*Fire door and shutter assemblies*).

1 The door assembly from the vestibule to the stairway shall have not less than a 90-minute
2 fire protection rating in accordance with Section 716.5 (*Fire door and shutter*
3 *assemblies*). The door from the building into the vestibule shall be provided with gaskets
4 or other provisions to minimize air leakage.
5

6 **[F]909.20.3.2 Vestibules.** The minimum pressure differences within the vestibule with
7 the doors closed shall be 0.05 inch water gage positive pressure relative to the fire floor
8 and 0.05 inch water gage negative relative to the exit enclosure. No pressure difference
9 is required relative to a non-fire floor.
10

11 **[F]909.20.3.3 Stair pressurization system.** If variable-frequency drive pressurization
12 fans are not used, the stair shaft shall be provided with a dampered relief opening capable
13 of discharging a minimum of 2,500 cubic feet per minute of air at the design pressure
14 difference of 0.05 inch water gage positive pressure relative to a pressurized stair
15 vestibule. Stair pressurization fans shall be sized to compensate for the stair shaft ground
16 floor exterior doors being open in addition to a minimum of three openings between the
17 stair shaft and the building (fire floor, floor above, and floor below).
18

19 **[F]909.21 Elevator hoistway pressurization alternative.** Where elevator hoistway
20 pressurization is provided in lieu of enclosed elevator lobbies as required in Section
21 713.14.1 (*Elevator lobby*), the pressurization system shall comply with Sections 909.21.1
22 (*Pressurization requirements*) through 909.21.11 (*System response time*).
23

24 **[F]909.21.1 Pressurization requirements.** Elevator hoistways shall be pressurized to
25 maintain a minimum positive pressure of 0.10 inches of water (25 Pa) and a maximum
26 positive pressure of 0.25 inches of water (67 Pa) with respect to adjacent occupied space
27 on all floors. This pressure shall be measured at the midpoint of each hoistway door, with
28 all elevator cars at the floor of recall and all hoistway doors on the floor of recall open
29 and all other hoistway doors closed. The opening and closing of hoistway doors at each
30 level must be demonstrated during this test. The supply air intake shall be from an
31 outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from
32 any air exhaust system or outlet.
33

34 **[F]909.21.2 Rational analysis.** A rational analysis complying with Section 909.4
35 (*Analysis*) shall be submitted with the construction documents.
36

37 **[F]909.21.3 Ducts for system.** Any duct system that is part of the pressurization system
38 shall be protected with the same fire-resistance rating as required for the elevator shaft
39 enclosure.
40

1 **[F]909.21.4 Fan system.** The fan system provided for the pressurization system shall be
2 as required by Sections 909.21.4.1 (*Fire resistance*) through 909.21.4.4 (*Fan capacity*).
3

4 **[F]909.21.4.1 Fire resistance.** When located within the building, the fan system that
5 provides the pressurization shall be protected with the same fire-resistance rating required
6 for the elevator shaft enclosure.
7

8 **[F]909.21.4.2 Smoke detection.** The fan system shall be equipped with a smoke detector
9 that will automatically shut down the fan system when smoke is detected within the
10 system.
11

12 **[F]909.21.4.3 Separate systems.** A separate fan system shall be used for each elevator
13 hoistway.
14

15 **[F]909.21.4.4 Fan capacity.** The supply fan shall either be adjustable with a capacity of
16 at least 1,000 cfm (0.4719 m³/s) per door, or that specified by a registered design
17 professional to meet the requirements of a designed pressurization system.
18

19 **[F]909.21.5 Standby power.** The pressurization system shall be provided with standby
20 power from the same source as other required emergency systems for the building.
21

22 **[F]909.21.6 Activation of pressurization system.** The elevator pressurization system
23 shall be activated upon activation of the building fire alarm system or upon activation of
24 the elevator lobby smoke detectors. Where both a building fire alarm system and elevator
25 lobby smoke detectors are present, each shall be independently capable of activating the
26 pressurization system.
27

28 **[F]909.21.7 Special inspection.** Special inspection for performance shall be required in
29 accordance with Section 909.18.8 (*Special inspections for smoke control*). System
30 acceptance shall be in accordance with Section 909.19 (*System acceptance*).
31

32 **[F]909.21.8 Marking and identification.** Detection and control systems shall be marked
33 in accordance with Section 909.14 (*Marking and identification*).
34

35 **[F] 909.21.9 Control diagrams.** Control diagrams shall be provided in accordance with
36 Section 909.15 (*Control diagrams*).
37

38 **[F]909.21.10 Control panel.** A control panel complying with Section 909.16 (*Fire-*
39 *fighter's smoke control panel*) shall be provided.
40

1 **[F]909.21.11 System response time.** Hoistway pressurization systems shall comply with
2 the requirements for smoke control system response time in Section 909.17 (*System*
3 *response time*).
4

5 **[F]909.22 Underground building smoke exhaust system.** Where required in
6 accordance with Section 405.5 (*Smoke control system*) for underground buildings, a
7 smoke exhaust system shall be provided in accordance with this section.
8

9 **[F]909.22.1 Exhaust capability.** Where compartmentation is required, each
10 compartment shall have an independent, automatically activated smoke exhaust system
11 capable of manual operation. The system shall have an air supply and smoke exhaust
12 capability that will provide a minimum of six air changes per hour.
13

14 **[F]909.22.2 Operation.** The smoke exhaust system shall be operated in the
15 compartment of origin by the following, independently of each other:
16

- 17 1. Two cross-zoned smoke detectors within a single protected area or a single
18 smoke detector monitored by an alarm verification zone or an approved
19 equivalent method.
20
- 21 2. The automatic sprinkler system.
22
- 23 3. Manual controls that are readily accessible to the fire department.
24

25 **[F]909.22.3 Alarm required.** Activation of the smoke exhaust system shall activate an
26 audible alarm at a constantly attended location.
27

28 **[F]912.1 Installation.** Fire department connections shall be installed in accordance with
29 the NFPA standard applicable to the system design and shall comply with Sections
30 912.1.1 (*Number of Hose Connections*) through 912.6 (*Inspection, testing and*
31 *maintenance*) of the International Fire Code.

32 **[F]912.1.1 Number of Hose Connections.** Fire department connections (FDC's) shall
33 include a minimum of two (2) 2½ inch (63.5 mm) female National Standard Hose Thread
34 (NST) inlet connections. Where system design flow rates exceed 500 gpm (1,893 lpm), a
35 minimum of one FDC inlet connection shall be installed for each 250 gpm (946 lpm) or
36 portion thereof.

37 **Exception:** Where permitted by other sections of this code or associated standards,
38 a single 1½ inch or 2½ inch FDC inlet is acceptable for residential fire sprinkler
39 systems installed in accordance with NFPA 13R. When an FDC is installed, a

single 1½ inch inlet is acceptable for residential system installed in accordance with NFPA 13D.

[F]912.3 Access. Immediate access to fire department connections shall be maintained at all times and without obstruction by fences, bushes, trees, walls, or any other fixed or moveable object for a minimum of 3 feet (914 mm). Access to fire department connections shall be approved by the fire chief.

Exception: Fences, where provided with an access gate equipped with a sign complying with the legend requirements of Section 912.4 (*Signs*) and a means of emergency operation. Locks, if installed shall be openable by use of a fire department Knox Key. The gate and means of emergency operation shall be approved by the fire chief and maintained operational at all times.

[F]912.3.1 Locking fire department connection caps. The fire code official is authorized to require locking caps on fire department connections for water-based fire protection systems. The locking caps shall be manufactured by an approved manufacturer and used and maintained as designed.

[F]912.3.1.2 Locking fire department connection caps in existing buildings or structures. The fire code official is authorized to require locking caps on fire department connections (FDC) for water-based fire protection systems serving existing buildings where the fire department has observed obstructions placed in the FDC or where the FDC is missing caps. The locking caps shall be manufactured by an approved manufacturer and used and maintained as designed.

[F]912.4.1 Fire Department Connection Placard – for existing structures. In addition to the signage required in 912.4 (*Signs*), an all-weather, permanent, system placard shall be placed in a visible location adjacent to the fire department connection on all structures over 10 floors in height and/or structures with a fire department connection requiring pressures exceeding 150 psi. The placard text shall be white reflective letters, 1 ½ inch minimum height, on either a red or black background. The placard shall contain the following information:

1. Required system pressure at FDC inlet.
2. Area of building served by FDC
3. System PRV locations

TABLE 1004.1.2
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR ^a
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
Exhibit Gallery and Museum	30 net
Assembly with fixed seats	See Section 1004.7
Assembly without fixed seats	
Concentrated	7 net
Standing space or queuing space	5 7 net
Unconcentrated (tables and chairs)	15 net
Bowling centers, allow 5 persons for each lane including 15 feet of runway, and for additional areas	7 net
Business areas	100 gross
Courtrooms—other than fixed seating areas	40 net
Day care	35 net
Dormitories	50 gross
Educational	
Classroom area	20 net
Shops and other vocational room areas	50 net
Exercise rooms	50 gross
Group H-5 Fabrication and manufacturing areas	200 gross
Industrial areas	100 gross
Institutional areas	
Inpatient treatment areas	240 gross
Outpatient areas	100 gross
Sleeping areas	120 gross
Kitchens, commercial	200 gross
Library	
Reading rooms	50 net
Stack area	100 gross
Mall buildings—covered and open	See section 402.8.2
Mercantile	
Areas on other floors	60 gross
Basement and grade floor areas	30 gross
Storage, stock, shipping areas	300 gross
Parking garages	200 gross
Residential	200 gross
Skating rinks, swimming pools	
Rink and pool	50 gross
Decks	15 gross
Stages and platforms	15 net
Warehouses	500 gross

For SI: 1 square foot = 0.0929 m².

a. Floor area in square feet per occupant.

1005.3.1 Stairways. The capacity, in inches (mm), of means of egress stairways shall be calculated by multiplying the occupant load served by such stairway by a means of egress capacity factor of 0.3 inch (7.6 mm) per occupant. Where stairways serve more than one story, only the occupant load of each story considered individually shall be used in calculating the required capacity of the stairways serving that story.

1005.3.2 Other egress components. The capacity, in inches (mm), of means of egress components other than stairways shall be calculated by multiplying the occupant load served by such component by a means of egress capacity factor of 0.2 inch (5.1 mm) per occupant.

1007.3 Stairways. In order to be considered part of an accessible means of egress, a stairway between stories shall have a minimum clear width of 48 inches (1219 mm) 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 (*Areas of refuge*) or a horizontal exit. Exit access stairways that connect levels in the same story are not permitted as part of an accessible means of egress.

Exceptions:

1. Except for a building governed by Section 403 (*High-Rise Buildings*) or 405 (*Underground Buildings*), the minimum clear width of 48 inches (1,219 mm) between handrails is not required in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 (*NFPA 13 sprinkler systems*) or 903.3.1.2 (*NFPA 13R sprinkler systems*).
2. Except for a building governed by Section 403 (*High-Rise Buildings*) or 405 (*Underground Buildings*), the area of refuge is not required at stairways in buildings equipped throughout by an automatic sprinkler system installed in accordance with Section 903.3.1.1 (*NFPA 13 sprinkler systems*) or 903.3.1.2 (*NFPA 13R sprinkler systems*).
3. The minimum clear width of 48 inches (1,219 mm) between handrails is not required for stairways accessed from a horizontal exit.
4. Areas of refuge are not required at exit stairways serving open parking garages.
5. Areas of refuge are not required for smoke protected seating areas complying with Section 1028.6.2 (*Smoke-protected seating*).

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 (*Revolving doors*).
6. In other than Group H-1, H-2, H-3 and H-4 occupancies, horizontal sliding doors complying with Section 1008.1.4.3 (*Horizontal sliding doors*) are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.4.2 (*Power-operated doors*).
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 a room or area containing an occupant load of 50 or more persons or a Group H occupancy.

1008.1.4.3. Horizontal sliding doors. In other than H-1, H-2, H-3 and H-4 occupancies, horizontal sliding doors permitted to be a component of a means of egress in accordance with Exception 6 to Section 1008.1.2 (*Door swing*) 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 716.5.9.3 (*Smoke-activated doors*), shall be installed in accordance with NFPA80 and shall comply with Section 716 (*Opening Protectives*).

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.

1008.1.9.7 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 (*NFPA 13 sprinkler systems*) or an approved automatic smoke or heat detection system installed in accordance with Section 907 (*Fire Alarm and Detection Systems*), provided that the doors unlock in accordance with Items 1 through 6 below. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an exit.

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a signal from the fire command center.
4. The initiation of an irreversible process which will release the latch in not more than 15 seconds when a force of not more than 15 pounds (67 N) is applied for 1 second to the release device. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the door lock has been released by the application of force to the releasing device, relocking shall be by manual means only.

Exception: Where approved, a delay of not more than 30 seconds is permitted.

5. A sign shall be provided on the door located above and within 12 inches (305 mm) of the release device reading: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 (30) SECONDS. The letters on the sign shall be 1 inch (25 mm) high and shall be on a contrasting background.
6. Emergency lighting shall be provided at the door.

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 at 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. When interior exit stairways are interconnected by a 1-hour fire-resistance-rated corridor conforming to the requirements of Section 1018 (*Corridors*), the required exit separation shall be measured along the shortest direct line of travel within the corridor.
2. For an exit and exit access doorway that is not the primary exit access into a required exit stairway and that is located in a building that is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 (*NFPA 13 sprinkler systems*) or 903.3.1.2 (*NFPA 13R sprinkler systems*), the separation distance of the exit door or exit access doorway shall be not less than one-third of the length of the maximum overall diagonal dimension of the area served.

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 (6,096 mm) in length.

Exceptions:

1. In occupancies in Group I-3 of Occupancy Condition 2, 3 or 4 (see Section 308.5 (*Group I-3*)), the dead end in a corridor shall not exceed 30 feet (9,144 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 (*NFPA 13 sprinkler systems*), 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.

1021.2 Exits from stories. Two exits, or exit access stairways or ramps providing access to exits, from any story or occupied roof shall be provided where one of the following conditions exists:

1. The occupant load or number of dwelling units exceeds one of the values in Table 1021.2(1) or 1021.2(2).

2. The exit access travel distance exceeds that specified in Table 1021.2(1) or 1021.2(2) as determined in accordance with the provisions of Section 1016.1.
3. Helistop landing areas located on buildings or structures shall be provided with two exits, or exit access stairways or ramps providing access to exits.

Exceptions:

1. Rooms, areas 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*.
2. Group R-3 occupancy buildings shall be permitted to have one exit.
3. Parking garages where vehicles are mechanically parked shall be permitted to have one exit.
4. Air traffic control towers shall be provided with the minimum number of exits specified in Section 412.3.
5. Individual dwelling units in compliance with Section 1021.2.3.
6. Group R-3 and R-4 congregate residences shall be permitted to have one *exit*.
7. Exits serving specific spaces or areas need not be accessed by the remainder of the story when all of the following are met:
 - 7.1. The number of exits from the entire story complies with Section 1021.2.4;
 - 7.2. The access to *exits* from each individual space in the story complies with Section 1015.1; and
 - 7.3. All spaces within each portion of a story shall have access to the minimum number of approved independent *exits* based on the occupant load of that portion of the story, but not less than two exits.

8. An elevator lobby may have one exit if the use of the exit does not require keys, tools, special knowledge or effort.

TABLE 1021.2(1)
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
Basement, first or second story	R-2 _{a,b}	2 dwelling units	125 feet
Third story and above	NP	NA	NA

For SI: 1 foot = 304.8 mm

NP – Not Permitted

NA – Not Applicable

- a. 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.
- b. This table is used for R-2 occupancies consisting of dwelling units. For R-2 occupancies consisting of sleeping units, use Table 1021.2(2).

TABLE 1021.2(2)
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM OCCUPANTS PER STORY	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
First story	A, B _b , E, F _b , M, U, S _b	49 occupants	75 feet
	H-2, H-3	3 occupants	25 feet
	H-4, H-5, I, R-1, R-2 _{a,c} , R-4	10 occupants	75 feet
	S	29 occupants	100 feet
Second story or basement	R-1, R-2, R-4, B, F, M, S, H _d	10 occupants	75 feet
Third story and above	NP	NA	NA

For SI: 1 foot = 304.8 mm.

NP – Not Permitted

NA – Not Applicable

- a. 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.
- b. 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.
- c. This table is used for R-2 occupancies consisting of sleeping units. For R-2 occupancies consisting of dwelling units, use Table 1021.2(1).
- d. Basement not allowed.

1026.3 Open side. Exterior exit stairways and ramps serving as an element of a required means of egress shall be open on at least two adjacent sides. A side is open if at least 75 percent of the area is free of any obstructions, including, but not limited to columns, beams, walls, handrails, and guards.

1 **1101.1 Scope.** The provisions of this chapter shall control the design and construction of
2 facilities for accessibility to physically disabled persons. Existing buildings and facilities
3 shall comply with the International Existing Building Code as adopted and incorporated
4 into the City Code.
5

6 **1101.2 Design.** Buildings and facilities that are not included in the scope of the Texas
7 Accessibility Standards (TAS) shall be designed and constructed to be accessible in
8 accordance with the Building Code and ICC A117.1. Buildings and facilities included in
9 the scope of TAS shall be designed and constructed to be accessible in accordance with
10 the Texas Accessibility Standards of the Architectural Barriers Act, Article 9102, Texas
11 Civil Statutes, as amended.
12

13 **1104.1 Site arrival points.** Accessible routes within the site shall be provided from
14 public transportation stops, accessible parking, accessible passenger loading zones, and
15 public streets or sidewalks to the accessible building entrance served. An accessible route
16 shall be located so that a person using the route is not required to travel in a traffic lane or
17 behind a parked vehicle (except the vehicle the person operates or in which the person is
18 a passenger).
19

20 **Exception:** Other than in buildings or facilities containing or serving Type A or
21 Type B units, an accessible route shall not be required between site arrival points
22 and the building or facility entrance if the only means of access between them is a
23 vehicular way not providing for pedestrian access.
24

25 **1106.6 Location.** Accessible parking spaces shall be located on the shortest accessible
26 route of travel from adjacent parking to an accessible building entrance. An accessible
27 route shall be located so that a person using the route is not required to travel in a traffic
28 lane or behind a parked vehicle (except the vehicle the person operates or in which the
29 person is a passenger). Accessible parking spaces shall be dispersed among the various
30 types of parking facilities provided. In parking facilities that do not serve a particular
31 building, accessible parking spaces shall be located on the shortest route to an accessible
32 pedestrian entrance to the parking facility. Where buildings have multiple accessible
33 entrances with adjacent parking, accessible parking spaces shall be dispersed and located
34 near the accessible entrances.
35

36 **Exceptions:**
37

- 38 1. In multilevel parking structures, van-accessible parking spaces are
39 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.

1107.6.1.2 Type B units. In structures with three 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 (*General exceptions*).

1107.6.2.1.2 Type B units. Where there are three 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 (*General exceptions*).

1107.6.2.2.2 Type B units. Where there are three 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 (*General exceptions*).

1107.6.3 Group R-3. In Group R-3 occupancies where there are three 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 (*General exceptions*).

1107.6.4.2 Type B units. In structures with three 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 (*General exceptions*).

1 **1109.15 Recreational and sport facilities.** Recreational and sport facilities shall be
2 provided with accessible features in accordance with Sections 1109.15.1 through
3 1109.15.4. Elements of recreational and sport facilities not covered by the design
4 standards in Section 1101.2 (*Design*) shall be designed in accordance with the “ADA and
5 ABA Accessibility Guidelines for Buildings and Facilities, Chapter 10: Recreational
6 Facilities”, published by the United States Access Board.

7
8 **1301 Energy Efficiency.** Buildings shall be designed and constructed in accordance
9 with the Energy Code, adopted by Chapter 25-12, Article 12 (*Energy Code*).

10 11 **SECTION 1512 OCCUPIED ROOFTOPS**

12 **1512.1 Construction requirements.** Roofs approved for rooftop occupancy shall have a
13 minimum fire resistance of one-hour or the fire resistance required for the building,
14 whichever is greater. Occupied roofs shall be treated as a floor for the following
15 construction related purposes.

- 16 1. For determining the required construction type and minimum fire
17 resistance rating for the roof structure.
- 18 2. For calculating occupant load and building height as they relate to
19 exiting requirements of Chapter 10 and thresholds for fire safety
20 features required by Sections 903 (*Automatic Sprinkler Systems*),
21 Section 905 (*Standpipe Systems*), and 907 (*Fire Alarm and*
22 *Detection Systems*).

23 **Exception:** The occupant load of an occupied roof that
24 complies with this section shall not contribute to the occupant
25 load of the fire area below for the purposes of requiring
26 automatic sprinkler and/or fire alarm protection provided that:
27 1) all openings from below are protected with fire resistive
28 assemblies, and 2) the occupied roof has code compliant exits
29 independent of the building or buildings below.

- 30 3. For the location and installation of toilet facilities.

31 **1512.2 Fall protection.** Occupied rooftops shall be provided with guards compliant with
32 Section 1013 (*Guards*).

33 **1512.3 Interstitial spaces.** When decks or other walking surfaces are constructed above
34 a roof to facilitate rooftop occupancy, the space between the roof/ceiling assembly and
35 the deck or surface shall be constructed in a manner that precludes the accumulation of

material between the roof/ceiling assembly and the deck or walking surface and that prevents the introduction of ignition sources to the space.

1512.4 Coverings above or around the occupants of an occupied rooftop. A rooftop equipped with a horizontal or vertical covering or coverings, including weather protection, such as a roof or a tent or membrane structure that exceeds the limitations of Chapter 24 (*Flammable Finishes*) of the Fire Code shall be considered an additional story and shall comply with the construction and occupancy requirements of the City Code as a floor.

Exceptions:

1. Small roof coverings may be approved for weather protection of restrooms and beverage preparation areas such as bars without requiring the rooftop to comply with all of the requirements of this code for a story or floor. Such coverings shall comply with the Building Code as to construction materials and fire resistance. The area of such coverings shall be limited to the minimum area required to comply with sanitation and health safety regulations.
2. An open noncombustible trellis or similar overhead shading device complying with the structural requirements of this code shall not be considered as a covering or roof provided that the trellis or shade has an evenly distributed net free area of 50 percent or greater.

1603.1.3 Roof snow load data. The ground snow load, P_g , shall be indicated. In areas where the ground snow load, P_g , exceeds 10 pounds per square foot (psf) (0.479 kN/m²), the following additional information shall also be provided, regardless of whether snow loads govern the design of the roof:

1. Flat-roof snow load, P_f .
2. Snow exposure factor, C_e .
3. Snow load importance factor, I .
4. Thermal factor, C_t .

Exception: Snow load information is only required when applicable.

1603.1.4 Wind design data. The following information related to wind loads shall be shown, regardless of whether wind loads govern the design of the lateral force-resisting system of the structure:

1. Ultimate design wind speed, V_{ult} , (3-second gust), miles per hour (km/hr) and nominal design wind speed, V_{asd} , as determined in accordance with Section 1609.3.1 (*Wind speed conversion*).

2. Risk category.
3. Wind exposure. Where more than one wind exposure is utilized, the wind exposure and applicable wind direction shall be indicated.
4. The applicable internal pressure coefficient.
5. Components and cladding. The design wind pressures in terms of psf (kN/m²) to be used for the design of exterior component and cladding materials not specifically designed by the registered design professional.

Exception: A note indicating that the engineer of record has reviewed and included wind design data in accordance with this section in his design analysis may be included in lieu of notes 1 through 5.

1607.4.1 Additional requirements.

1. Garage loadings shall not include an impact factor for floors or roofs.
2. Ramp loadings shall be the same as floors.
3. Garage roofs used for passenger vehicles or trucks and bus parking shall be designed for a non-reducible live load of 55 psf., which includes snow and snow removal equipment. Garage roofs that provide access for fire trucks shall be designed for the required fire truck loads.
4. Dining rooms and restaurants. A nonresidential kitchen shall be designed for the same design load as the occupancy served. Use the weight of actual equipment or stored materials when greater than the design load established in ASCE7.

1607.8.1 Handrails and guards. Handrails and guards shall be designed to resist a linear load of 50 pounds per linear foot (plf) (0.73 kN/m) applied in any direction at the top and to transfer this load through the supports to the structure and must be in accordance with Section 4.5.1 of ASCE 7. Glass handrail assemblies and guards shall also comply with Section 2407 (*Glass in Handrails and Guards*).

1607.10.2 Alternative floor live load reduction. As an alternative to Section 1607.10.1 (*Basic uniform live load reduction*) and subject to the limitations of Table 1607.1 (*Minimum Uniformly Distributed Live Loads, and Minimum Concentrated Live Loads*), uniformly distributed live loads are permitted to be reduced in accordance with the following provisions. Such reductions shall apply to slab systems, beams, girders, columns, piers, walls and foundations.

1. A reduction shall not be permitted where the live load exceeds 100 psf (4.79 kN/m²) except that the design live load for members supporting two or more floors is permitted to be reduced by a maximum 20 percent.

Exception: For uses other than storage, where approved, additional live load reductions shall be permitted where shown by the registered design professional that a rational approach has been used and that such reductions are warranted.

2. A reduction shall not be permitted in passenger vehicle parking garages except that the live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent.
3. For live loads not exceeding 100 psf (4.79 kN/m²), the design live load for any structural member supporting 150 square feet (13.94 m²) or more is permitted to be reduced in accordance with Equation 16-24.
4. For one way slabs, the area, A, for use in Equation 16-24 shall not exceed the product of the slab span and a width normal to the span of 0.5 times the slab span.
5. For structural members supporting more than 150 square feet in garages used for the storage of passenger vehicles, the reduced live load shall not be less than 30 pounds per square foot.

$$R = 0.08 (A - 150) \quad \text{(Equation 16-24)}$$

$$\text{For SI: } R = 0.861 (A - 13.94)$$

Such reduction shall not exceed the smallest of:

1. 40 percent for horizontal members;
2. 60 percent for vertical members; or
3. R as determined by the following equation.

$$R = 23.1 (1 + D/L_o) \quad \text{(Equation 16-25)}$$

where:

A = Area of floor supported by the member, square feet (m²).

D = Dead load per square foot (m²) of area supported.

L_o = Unreduced live load per square foot (m²) of area supported.

R = Reduction in percent.

1 **1607.15 Fire truck loading.** If fire department access requires travel over a structure or
2 loading of a structure by fire department vehicles, the structure shall be analyzed for the
3 three load cases indicated below. Structural members shall be designed for the most
4 severe case. The fire vehicle geometry is shown in Figure 1607.15.

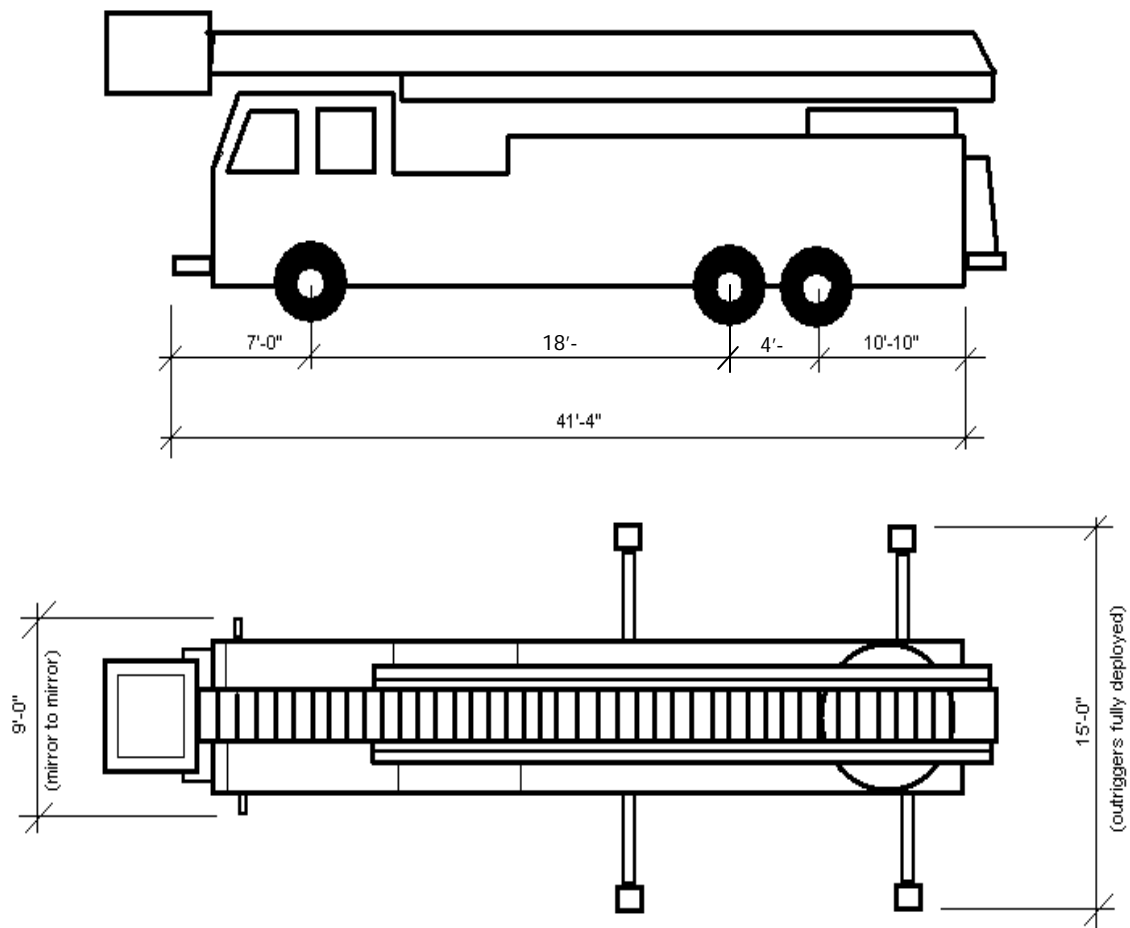
- 5 1. Basic Load Case. The front axle load shall be 21,130 pounds (10,565
6 pounds per tire) with a tire contact area of 12 in. x 13 in. The load on each
7 rear axle shall be 25,700 pounds (12,850 pounds per tire) with a tire contact
8 area of 14 in. x 16 in. Impact and longitudinal forces imparted by the
9 vehicle loads shall be in accordance with the latest edition of AASHTO
10 standards.
- 11 2. Static Load Case A. A load of 43,200 pounds on one outrigger. The contact
12 area of each outrigger is 24 in. x 24 in. The load is to be located so as to
13 produce the maximum stress in the member(s) being analyzed when applied
14 according to the geometry of Figure 1607.15.
- 15 3. Static Load Case B. A load of 28,600 pounds on each of two adjacent
16 outriggers (total load is 57,200 pounds). The contact area of each outrigger
17 is 24 in. x 24 in. The load is to be located so as to produce the maximum
18 stress in the member(s) being analyzed when applied according to the
19 geometry of Figure 1607.15.

20 The Fire Prevention Bureau shall determine the area around any building or structure for
21 which fire access is required and the provisions of this section are applicable.
22

1
2

Figure 1607.15

2001 Pierce, Ladder 1 and Ladder 8



SECTION 1612 FLOOD LOADS

1612.1 General. Within flood hazard areas as established in Section 1612.3, (*Establishment of flood hazard areas*) all new construction of buildings, and alterations to buildings and structures, structures and portions of buildings and structures, including substantial improvements and restoration of substantial damage to buildings and structures, shall be designed and constructed to resist the effects of flood hazards and flood loads. All elevation requirements noted in this ordinance shall be documented using the Elevation Certificate, FEMA 81-31, and shall be certified by a registered professional engineer, surveyor, or architect, and shall be submitted to the Floodplain Administrator.

1612.2 Definitions. The following terms are defined in Chapter 2:

BASE FLOOD

BASE FLOOD ELEVATION

BASEMENT

DESIGN FLOOD

DESIGN FLOOD ELEVATION

DRY FLOODPROOFING

EXISTING CONSTRUCTION

EXISTING STRUCTURE

FLOOD or FLOODING

FLOOD DAMAGE-RESISTANT MATERIALS

FLOOD HAZARD AREA

FLOOD INSURANCE RATE MAP (FIRM)

FLOOD INSURANCE STUDY

FLOODWAY

LOWEST FLOOR

NEW CONSTRUCTION

REGULATORY FLOOD DATUM

SPECIAL FLOOD HAZARD AREA

START OF CONSTRUCTION

SUBSTANTIAL DAMAGE

SUBSTANTIAL IMPROVEMENT

1612.3 Establishment of flood hazard areas. Flood hazard areas are established to include the following:

1. the flood hazard areas identified by the Federal Emergency Management Agency in a scientific and engineering report entitled, "The Flood Insurance Study for Austin, Texas," dated September 26, 2008, with accompanying Flood Insurance Rate Maps and Flood Boundary-Floodway Maps (FIRM and FBFM) and related supporting data along with any amendments or revisions thereto are hereby adopted by reference and declared to be a part of this section; and
2. the 100-year and 25-year floodplains based on projected full development as specified in the Austin City Code and Drainage Criteria Manual are adopted by reference and declared to be part of this section.

1612.4 Design and construction. The design and construction of buildings and structures, and additions and alterations to buildings and structures located in flood hazard areas, shall be in accordance with ASCE 24, Flood Resistant Design and Construction.

1612.4.1 Freeboard. A minimum freeboard of one (1) foot shall be added where the design flood elevation or other elevation requirements are specified.

1612.4.2 Provisions of Safe Refuge.

1. Buildings or structures constructed in the flood hazard area where the ground surface is below the design flood elevation, or where flood water velocities at the building may exceed five feet per second, shall be provided with an enclosed refuge space one (1) foot or more above the design flood elevation of sufficient area to provide for the occupancy load with a minimum of 12 square feet per person. The refuge space shall be provided to an exterior platform and stairway not less than three feet wide.
2. Existing buildings and structures in flood hazard areas which are enlarged, extended, or altered, or where a change of use or occupancy is made, shall conform to the requirements of Subsection 1.
3. No floor level or portion of a building or structure that is lower than one (1) foot above the design flood elevation, regardless of the structure or space classification, shall be used residentially, or for storage of any property,

materials, or equipment that might constitute a safety hazard when contacted by flood waters.

1612.4.3 Means of Egress. Normal access to the building shall be by direct connection with an area that is a minimum of one (1) foot above the design flood elevation, unless otherwise approved by the building official.

1612.5 Flood hazard documentation. The following documentation shall be prepared and sealed by a registered design professional and submitted to the building official:

1. For construction in flood hazard areas:

1.1. the elevation of the lowest floor, including the basement, as required by the lowest floor elevation inspection in Sections **110.3.1.3.1** (*Lowest floor elevation*) and 110.3.10.1 (*Flood hazard documentation*);

1.2. for fully enclosed areas below the design flood elevation where provisions to allow for the automatic entry and exit of floodwaters do not meet the minimum requirements in Section 2.6.2.1 of ASCE 24, construction documents shall include a statement that the design will provide for equalization of hydrostatic flood forces in accordance with Section 2.6.2.2 of ASCE 24; and

1.3. For dry flood-proofed nonresidential buildings, construction documents shall include a statement that the dry floodproofing is designed in accordance with ASCE 24.

1704.2.3 Statement of special inspections. The permit applicant shall submit a statement of special inspections prepared by the registered design professional in charge and responsible in accordance with Section 107.1 (*General*) as a condition for permit issuance. This statement shall include a complete list of materials and work requiring special inspections by this section and the inspections to be performed. The owner or owner's agent shall submit, for the building official's review, a list of the individuals, agencies, or firms intended to be retained for conducting such inspections.

SECTION 1712 REGISTERED INDUSTRIAL PLANT

Section 1712.1 Definition. A registered industrial plant is one or more buildings registered with the building official under Section 1712.3 (*Application and fee*) used for manufacturing, processing, research and development, education, health care or service that requires specialized buildings, utilities, and equipment.

Section 1712.2 Requirements. The following requirements apply to a registered industrial plant:

1. A registered industrial plant may not have less than 100,000 square feet of floor area in a building or buildings at locations within the city limits and used for manufacturing, processing, research and development, or service that requires specialized building, utilities, and equipment and where no fewer than 200 persons are employed.
2. A registered industrial plant must employ full time personnel for the operation and maintenance of buildings, utilities, and equipment; and must comply with all requirements of the Building Code.
3. The owner of a registered industrial plant must designate a full time employee (the "responsible official") who is responsible for ensuring compliance with all code provisions enforced by the building official. The responsible official must be a registered design professional in the State of Texas or a person approved by the building official.

Section 1712.3 Application and fee. An applicant for registration under this section must file an application on a form required by the building official. The application fee is refunded if the application is denied. The application must include both the name of the person with the authority to act for and on behalf of the owner of the plant, and the name of the person proposed by the applicant to be the responsible official under this section.

Exception: A registered industrial plant may include leased buildings if both the entire building is leased by the owner of the plant and the maintenance and operation of the leased building is under the control of the responsible official.

The building official shall provide written notice to the applicant if the application is denied or disapproved pending receipt of additional information. The notice must include a statement of the building official's reasons for denying or disapproving the application under this section.

A registration under this section expires on December 31 of the year it is approved. The registration may be renewed on or before December 31 for a one year period by payment of a renewal fee at a rate of \$550 per 100,000 square feet of floor area of buildings registered under this section.

Section 1712.4 Exemption from plan review and permit fees. The owner of a registered industrial plant is not required to obtain a permit otherwise required by the Building Code if the owner complies with Section 1712.5 (*Work reports and inspections*) and the work:

1. does not alter a bearing wall or other structural elements;
2. does not require a change to an exit system;
3. does not alter fire-resistive construction;

4. is performed on a building or structure for which a certificate of occupancy for the existing occupancy had been issued by the building official;
5. does not alter natural gas piping or medical gas piping systems;
6. does not alter hazardous production material (HPM) supply or waste piping in areas of the building not currently classified as an H occupancy;
7. does not remove, relocate, replace, or install a backflow prevention device;
8. does not increase the existing square footage of a building;
9. otherwise complies with all other applicable provisions of this title; and
10. is performed by licensed contractors under the registered industrial plant provisions of the Plumbing Code, Electrical Code or Mechanical Code.

Section 1712.5 Work reports and inspections. A brief description of all work performed under this section must be maintained by the responsible official and must be available to the building official during periodic inspections. The building official shall inspect work performed under this section at least every six months.

Section 1712.6 Change of responsible official. If the responsible official leaves the full-time employment of the registrant, an acting responsible official who is qualified under Section 1712.2 (*Requirements*) shall be designated by the registrant not later than seven days after the employee leaves full-time employment fewer than seven days' notice to the building official. An acting responsible official may serve for a period not to exceed 45 days. If a new responsible official is not designated within the 45 day period, registration under this section will be suspended until a new responsible official is designated.

Section 1712.7 Revocation or termination of registration. The building official may suspend or revoke a registration under this section if the registrant fails to comply with any of the requirements of Section 1712 (*Registered Industrial Plant*) or with any requirement of the City Code with respect to work performed under these sections. A suspension or revocation is not effective until the building official has provided written notice to the registrant of the suspension or revocation. The notice shall include a statement of the building official's reasons for the action. A registrant may terminate its registration by delivering written notice of termination to the building official.

SECTION 1811 EARTH RETENTION SYSTEMS

1811.1 Tieback anchors and soil and rock nails. Tieback anchors and soil and rock nails that are allowed in the public right-of-way as components of earth retention systems as provided in Section 3202.1.4 (*Earth retention system components*) shall comply with

Sections 1811.1.1 (*Depth of tiebacks anchors and soil and rock nails*) through 1811.1.3 (*Length of tiebacks anchors and soil and rock nails*).

1811.1.1 Depth of tieback anchors and soil and rock nails. At the right-of-way line, tieback anchors and soil and rock anchors must be at least 6 feet (1829 mm) below the elevation of the adjacent street curb.

1811.1.2 Separation distance from buried utilities. Tieback anchors and soil and rock nails must be below and at least five feet (1524 mm) away from the nearest outside surface of any existing or planned buried utility in the public right-of-way.

1811.1.3 Length of tieback anchors and soil and rock nails. Tieback anchors and soil and rock nails that extend beyond the center of the public right-of-way are prohibited.

2108.4 ACI 530/ASCE 5/TMS402, Section 3.1.7.2.2. Modify Section 3.1.7.2.2 as follows:

3.1.7.2.2 In plane bending – For masonry subjected to in-plane loads, the modulus of rupture, f_r , normal and parallel to the bed joints shall be taken from Table 3.1.7.2.1. For grouted stack bond masonry, tension parallel to the bed joints shall be assumed to be resisted only by the continuous horizontal grout section.

2407.1 Materials. Glass used as a handrail assembly or a guard section shall be constructed of either laminated fully tempered glass or laminated heat-strengthened glass. Glazing in railing in-fill panels shall be of an approved safety glazing material that conforms to the provisions of Section 2406.1.1. For all glazing types, the minimum nominal thickness shall be 1/4 inch (6.4 mm). Fully tempered glass and laminated glass shall comply with Category II of CPSC 16 CFR Part 1201 or Class A of ANSI Z97.1.

3102.1 General. The provisions Sections 3102.1 (*General*) through 3102.8 (*Inflation systems*) shall apply to air-supported, air-inflated, membrane-covered cable and membrane-covered frame structures, collectively known as membrane structures separated by at least 20 feet (6,096 mm) from any building as specified in IFC Section 3103.8.2 (*Location*) and erected for a period of 180 days or longer. The provisions of this section also apply to membrane structures separated by less than 20 feet from any building and erected for a period of 90 days or longer. Those erected for a shorter period of time shall comply with the International 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 (*Membrane and interior liner material*) and 3102.7 (*Engineering design*). Membrane structures erected on a building, balcony, deck or other structure for any period of time shall comply with this section.

1 **3103.5 Portable classrooms.** Portable classroom buildings may be moved into or within
2 this jurisdiction or within a public school district without conforming to the adopted
3 Energy Code.

4 **3103.6 Moved residential buildings.** Residential buildings or structures moved into or
5 within the City's zoning jurisdiction shall be sited in compliance with applicable
6 provisions of Title 25 of the City Code. Foundations of relocated residential buildings or
7 structures must comply with the provisions of the Building Code for new buildings or
8 structures. All other building elements must comply with the requirements of the
9 International Residential Code.

10 **3103.7 Moved non-residential buildings.** Non-residential buildings moved into or
11 within the City's zoning jurisdiction must comply with the provisions of the Building
12 Code for new buildings or structures.

13 **3109.3 Public swimming pools.** Public swimming pools shall be enclosed as required
14 by the Texas Department of Health Standards for Swimming Pools and Spas.

15 **3112 AERIAL PASSAGEWAYS**

16 **3112.1 Defined.** An aerial passageway is a structure located over an alley or street
17 connecting two buildings on opposite sides of the alley or street.

18 **3112.2 Requirements.** An aerial passageway shall comply with this section.

- 19 1. The structure shall be used for access only and not for storage or occupancy.
- 20 2. The structure shall be constructed entirely of non-combustible materials.
- 21 3. Self-closing Class A doors shall be placed at each end of the passageway.
- 22 4. If the structure interferes with any public utility facilities, all costs associated
23 with relocation and remediation shall be borne by the Owner.
- 24 5. No electric, gas, or water shall be attached to or be permitted to cross on or
25 in the aerial passageway. Telephone and other communication utilities may
26 be allowed subject to the execution of a license agreement.
- 27 6. Except as otherwise provided in the section, a minimum clearance of 18 feet
28 above the surface of the alley or street is required. The building official may
29 allow a height that is less than 18 feet but not less than 17 feet if he
30 determines that the lower height will result in an equivalent installation.
- 31 7. A license agreement required by City Code Chapter 14-11 is executed.
- 32

3201.1 Scope. The provisions of this chapter shall govern the encroachment of structures into the public right-of-way, including components of earth retention systems used to facilitate below-grade construction of a building or structure.

3202.1 Encroachments below grade. Encroachments below grade shall comply with Sections 3202.1.1 (*Structural support*) through 3202.1 (*Earth retention system components*).

3202.1.4 Earth retention system components. Components of earth retention systems that are required for structural support of a building or structure are prohibited in the public right-of-way. Components of earth retention systems that are needed only during construction of the below-grade portion of a building or structure are subject to the following conditions:

1. Approval of the Director of the Public Works Department is required before construction of earth retention system components in public right-of-way commences.
2. All components of an earth retention system are prohibited in the public right-of-way except for (1) tieback anchors that are part of a soldier pile and lagging system; (2) tieback anchors that are part of a diaphragm or slurry wall system; (3) tieback anchors that are part of a sheet pile wall system; (4) tieback anchors that are part of a secant wall system; and (5) soil or rock nails that are part of a nail wall.
3. Tieback anchors or soil or rock nails that are necessary as functional components of the earth retention system for longer than 12 months are prohibited in the public right-of-way.
4. Tieback anchors and soil and rock nails allowed in the public right-of-way must be designed according to the criteria in Section 1811 (*Earth Retention Systems*).

CHAPTER 34 EXISTING STRUCTURES

(A) The International Existing Building Code, 2012 edition, published by the International Code Council is adopted and incorporated into this section with deletions and amendments in Subsections (B) and (C).

(B) The following provisions of the 2012 International Existing Building Code are deleted:

Sec. 103	Sec. 105.1.1	Sec. 105.1.2	Sec. 105.3
Sec. 105.3.2	Sec. 105.5	Sec. 106.2.3	Sec. 106.2.5
Sec. 109.3.1	Sec. 109.3.3	Sec. 109.3.5	Sec. 111.3

1 Sec. 112

- 2 (C) The following provisions are local amendments to the 2012 International
3 Existing Building Code. Each provision in this section is substitute for the
4 identically numbered provision deleted by Section (B) or is an addition to
5 the 2012 International Existing Building Code.

6
7 **103 Building official.** The City Manager shall appoint a building official to administer
8 and interpret this Code. The building official may appoint one or more deputy building
9 officials.

10 **[A]105.3 Application for permit.** To obtain a permit, the applicant shall first file a
11 permit application in writing on a form furnished by the Building official for that
12 purpose. The permit application shall:

- 13 1. Identify and describe the work to be covered by the permit for which the
14 application is made.
- 15 2. Describe the land on which the proposed work is to be done by legal
16 description, street address, or similar description that will readily identify
17 and definitely locate the proposed building or work.
- 18 3. Indicate the use and occupancy for which the proposed work is intended.
- 19 4. Be accompanied by construction documents and other information as
20 required in Section 106.3 (*Examination of documents*).
- 21 5. State the valuation of the proposed work.
- 22 6. Be signed by the applicant, or the applicant's authorized agent.
- 23 7. Give such other data and information as required by the building official.
- 24 8. Trench protection. An application must include certification by a registered
25 professional engineer that trench safety systems have been designed in
26 accordance with state law and OSHA standards.

27 **[A]105.5 Time Limitation on Application; Permit Expiration and Reactivation.**
28 Time limits on permit applications and requirements for permit expiration and
29 reactivation, including a review fee for expired permits, are set forth in Chapter 25-12,
30 Article 13 (*Administration of Technical Codes*).

31
32 **105.8 Transfer of permit.** The building official is authorized to establish a building
33 permit transfer policy.

1 **106.2.2.1 Fire protection at penetrations.** Deferred submittal shop drawings and
2 schedules that are submitted shall indicate the fire protective assemblies proposed for
3 installation at all penetrations through fire and smoke construction in accordance with
4 Sections 714 (*Penetrations*) and 715 (*Fire-Resistant Joint Systems*) of the 2012
5 International Building Code.

6 **[A]106.2.3 Means of Egress.** The construction documents shall show in sufficient detail
7 the location, construction, size, and character of all portions of the means of egress in
8 compliance with the provisions of this code. The construction documents shall designate
9 the number of occupants to be accommodated on every floor and in every room or space
10 that is part of an assembly occupancy.

11 **[A]106.2.5 Site plan.** The construction documents submitted with the permit application
12 shall be accompanied by a site plan showing to scale the size and location of new
13 construction and existing structures on the site, distances from lot lines, the established
14 street grades and the proposed finished grades and, as applicable, flood hazard areas,
15 floodways, and design flood elevations; and it shall be drawn in accordance with an
16 accurate boundary line survey. In the case of demolition, the site plan shall show
17 construction to be demolished and the location and size of existing structures and
18 construction that are to remain on the site or plot. For a building or structure involving
19 below-grade construction, the site plan shall show the location of proposed earth
20 retention system components allowed under Section 3202.1.4 (*Earth Retention System*
21 *Components*) of the 2012 International Building Code. The building official is
22 authorized to waive or modify the requirement of the site plan when the permit
23 application is for alteration, repair, or when otherwise warranted.

24 **107.5 Temporary earth retention systems.** Temporary earth retention system
25 components used to facilitate below-grade construction of a building or structure shall
26 conform to Sections 1811 (*Earth Retention Systems*) and Section 3202.1.4 (*Earth*
27 *retention system components*) of this code.

28 **108.7 Plan review fees.** An applicant must pay a plan review fee, adopted by separate
29 ordinance when plans and specifications are submitted for review under Section 106
30 (*Construction Documents*). The building official shall compute the building plan review
31 fees using the total value of all construction work for which the permit is issued as well
32 as the value of all finish work, painting, roofing, electrical, plumbing, heating, air
33 conditioning, elevators, fire-extinguishing systems, and other permanent equipment. The
34 building official shall charge an additional plan review fee if plans are incomplete or
35 changed so as to require additional plan review. The plan review fees referenced in this
36 section are in addition to the permit fees referenced in Section 108.1 (*Payment of fees*).

37 **[A]109.3.1 Building pre-construction inspection.** This is the first inspection
38 conducted. The inspector verifies the permits that were issued for work at a site and

meets with the contractor or owner at the site to review plans and identify potential issues. The inspector notifies the contractor of the inspector's work hours, identifies required inspections, and leaves a green sign-off tag for future inspections.

[A]109.3.1.2 Layout Inspection. A layout inspection shall be made after all foundation forms have been erected and are in place, but before any concrete is placed.

[A]109.3.1.3 Footing and foundation inspection. Footing and foundation inspections shall be made after excavations for footings are complete and any required reinforcing steel is in place. For concrete foundations, any required forms shall be in place prior to inspection. Materials for the foundation shall be on the job, except where concrete is ready mixed in accordance with ASTM C 94, the concrete need not be on the job.

[A]109.3.1.3.1 Lowest floor elevation. For additions and substantial improvements to existing buildings in flood hazard areas, upon placement of the lowest floor, including basement, and prior to further vertical construction, the elevation documentation required in the International Building Code shall be submitted to the building official.

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

Exception: Gypsum board that is not part of a fire-resistance-rated wall, a shear assembly, or a tub and shower surround, limited to a maximum of 32 square feet.

110.5 Maintenance of records. The building owner or the owner's authorized agent must maintain a copy of the certificate of occupancy on the premises and provide it to an authorized official on request.

[A] 111.3 Authority to disconnect service utilities. The building official may authorize the disconnection of utility service to the building, structure, or service system regulated by this Code and the codes referenced under this section.

111.3.1 Circumstances for which utilities may be disconnected. The building official may authorize disconnection of utilities if the building official determines that:

1. disconnection is necessary to eliminate an immediate hazard to life or property;
2. an owner or occupant is in violation of a stop work order;
3. electrical work has been installed without a permit;
4. plumbing or gas piping has been installed without a permit; or
5. development does not comply with the land development regulations.

111.3.2 Notice. This section prescribes notice requirements for disconnection of utilities.

111.3.2.1 Disconnection because of an immediate threat to life or property. If disconnection of utilities is necessary to eliminate an immediate hazard to life, the building official shall notify the serving utility and whenever possible, the owner and occupant of the building, structure, or service system of the decision prior to taking any action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing, by certified mail, return receipt requested, as soon as practical thereafter.

111.3.2.2 Disconnection for a reason other than an immediate threat to life or property. If the disconnection of utilities is for a reason other than to eliminate an immediate hazard to life, the building official shall give notice according to this section. Notice shall first be provided for the violation in accordance with the applicable section of Title 25 (*Land Development*). The notice of violation shall include a statement that the building official may authorize the disconnection of utilities if the violation is not cured within the timeframe established in the notice of violation. If the owner or occupant fails to comply with the notice of violation, the building official may issue a notice to the owner and occupant stating that utilities to the property will be disconnected not less than one week after the date that the notice is mailed. The notice must identify each utility that will be disconnected.

SECTION 112 BUILDING AND FIRE CODE BOARD OF APPEALS

Regulations regarding the Building and Fire Code Board of Appeals are found in Chapter 2-1 of the City Code.

APPENDIX G FLOOD-RESISTANT CONSTRUCTION

The provisions contained in this appendix are mandatory.

SECTION G100 STATUTORY AUTHORIZATION

As a home-rule city, the City of Austin has the responsibility and power to adopt regulations designed to minimize flood losses. The Legislature of the State of Texas has in Sections 16.3145 and 16.315 of the Texas Water Code authorized local government units to adopt regulations designed to minimize flood losses.

SECTION G101 ADMINISTRATION

G101.1 Purpose. The purpose of this appendix is to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific flood hazard areas through the establishment of comprehensive regulations for management of flood hazard areas designed to:

1. Prevent unnecessary disruption of commerce, access and public service during times of flooding.
2. Manage the alteration of natural flood plains, stream channels and shorelines.
3. Manage filling, grading, dredging and other development which may increase flood damage or erosion potential.
4. Prevent or regulate the construction of flood barriers which will divert floodwaters or which can increase flood hazards.
5. Contribute to improved construction techniques in the flood plain.
6. Restrict or prohibit uses that are dangerous to health, safety or property in times of flood, or cause excessive increases in flood heights or velocities; and
7. Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction.

G101.2 Objectives. The objectives of this appendix are to protect human life, minimize the expenditure of public money for flood control projects, minimize the need for rescue and relief efforts associated with flooding, minimize prolonged business interruption, minimize damage to public facilities and utilities, help maintain a stable tax base by providing for the sound use and development of flood-prone areas, contribute to improved construction techniques in the flood plain and ensure that potential owners and occupants are notified that property is within flood hazard areas.

G101.3 Scope. The provisions of this appendix shall apply to all proposed development in a flood hazard area established in Section 1612 (*Flood Loads*) of the Building Code.

G101.4 Violations. Any violation of a provision of this appendix, or failure to comply with a permit or variance issued pursuant to this appendix or any requirement of this appendix, shall be handled in accordance with Section 114 (*Violations*).

SECTION G102 APPLICABILITY

G102.1 General. This appendix, in conjunction with the Building Code, provides minimum requirements for development located in flood hazard areas, including the subdivision of land; installation of utilities; placement and replacement of manufactured homes; new construction and repair, reconstruction, rehabilitation, or additions to new construction and substantial improvement of existing buildings and structures, including restoration after damage-

G102.1.1 Abrogation and greater restrictions. This appendix is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions.

However, where this appendix and another city code provision, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

G102.2 Establishment of flood hazard areas. Flood hazard areas are established in Section 1612.3 (*Establishment of flood hazard areas*).

G102.3. Nonconforming Uses.

A structure, or the use of a structure or premises, which was lawful before the adoption of the Building Code, but which does not conform with the requirements of these regulations, may be continued subject to the following conditions:

1. No such use shall be expanded, changed, enlarged, or altered in a way which increases its nonconformity.
2. No substantial improvement of the structure shall be made unless the structure is changed to conform to these regulations.
3. If a nonconforming use is discontinued for a period of 90 days, any future use of the building or premises shall conform to these regulations.
4. Any nonconforming use or structure which is destroyed by means, including floods, to an extent of 50 percent or more of its market value, shall not be reconstructed except in conformance with the provisions of these regulations.

SECTION G103 POWERS AND DUTIES

G103.1 Permit applications. The building official shall review all permit applications to determine whether proposed development sites will be reasonably safe from flooding. If a proposed development site is in a flood hazard area, all site development activities (including grading, filling, utility installation, and drainage modification), and all new construction and substantial improvements (including the placement of prefabricated buildings and manufactured homes) shall, at a minimum, be designed and constructed with methods, practices and materials that minimize flood damage and that are in accordance with this code and ASCE 24.

G103.2 Other permits. It shall be the responsibility of the building official to assure that approval of a proposed development shall not be given until proof that necessary permits have been granted by federal or state agencies having jurisdiction over such development.

G103.3 Determination of design flood elevations. If design flood elevations are not specified, the building official is authorized to require the applicant to:

1. Obtain, review and reasonably utilize data available from a federal, state or other source, or
2. Determine the design flood elevation in accordance with the 100-year floodplain based on projected full development in accordance with the City of Austin Drainage Criteria Manual. Such analyses shall be performed and sealed by a Professional Engineer licensed by the State of Texas. Studies, analyses and computations shall be submitted in sufficient detail to allow review and approval by the building official. The accuracy of data submitted for such determination shall be the responsibility of the applicant.

G103.4 Activities in riverine flood hazard areas. In riverine situations, the building official shall not permit any new construction, substantial improvement, or other development, including fill, unless the applicant demonstrates that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the design flood elevation at any point that results in adverse flooding impact on other property.

G103.5 Floodway encroachment. Prior to issuing a permit for any floodway encroachment, including fill, new construction, substantial improvements and other development or land-disturbing activity, the building official shall require submission of a certification by a Professional Engineer licensed by the State of Texas, along with supporting technical data in accordance with the City of Austin Drainage Criteria Manual, that demonstrates that such development will not cause any increase of the level of the design flood.

G103.5.1 Floodway revisions. A floodway encroachment that increases the level of the design flood may be considered for a variance only if the applicant has applied for a conditional Flood Insurance Rate Map (FIRM) revision and has received the approval of the Federal Emergency Management Agency (FEMA) provided the conditional Flood Insurance Rate Map (FIRM) revision is required by the City of Austin Drainage Criteria Manual.

G103.6 Watercourse alteration. Prior to issuing a permit for any alteration or relocation of any watercourse, the building official shall require the applicant to provide notification of the proposal to the appropriate authorities of all affected adjacent government jurisdictions, as well as appropriate state agencies. A copy of the notification shall be maintained in the permit records and submitted to FEMA.

G103.6.1 Engineering analysis. The building official shall require submission of an engineering analysis in accordance with the City of Austin Drainage Criteria Manual performed and sealed by a Professional Engineer licensed by the State of Texas which demonstrates that the flood-carrying capacity of the altered or relocated portion of the

watercourse will not be decreased. Such watercourses shall be maintained in a manner which preserves the channel's flood-carrying capacity.

G103.7 Records. The building official shall maintain a permanent record of all permits issued in flood hazard areas, including copies of inspection reports and certifications required in Section 1612 (*Flood Loads*).

SECTION G104 PERMITS

G104.1 Required. Any person, owner or authorized agent who intends to conduct any development in a flood hazard area shall first make application to the building official and shall obtain the required permit.

G104.2 Application for permit. The applicant shall file a permit application in writing on a form furnished by the building official. Such application shall:

1. Identify and describe the development to be covered by the permit.
2. Describe the land on which the proposed development is to be conducted by legal description, street address, or similar description that will readily identify and definitely locate the site.
3. Include a site plan showing the delineation of flood hazard areas, floodway boundaries, flood zones, design flood elevations, ground elevations, proposed lowest floor elevation, proposed fill and excavation and drainage patterns and facilities.
4. Indicate the use and occupancy for which the proposed development is intended.
5. Be accompanied by construction documents, grading and filling plans, and other information deemed appropriate by the building official.
6. State the valuation of the proposed work.
7. Be signed by the applicant or the applicant's authorized agent.

G104.3 Validity of permit. The issuance of a permit under this appendix shall not be construed to be a permit for, or approval of, any violation of this appendix or any other ordinance of the jurisdiction. The issuance of a permit based on submitted documents and information shall not prevent the building official from requiring the correction of errors. The building official is authorized to prevent occupancy or use of a structure or site which is in violation of this appendix or other ordinances of the City of Austin.

G104.4 Time Limitation on Application; Permit Expiration and Reactivation. Time limits on permit applications and requirements for permit expiration and reactivation,

including a review fee for expired permits, are set forth in Chapter 25-12, Article 13 (*Administration of Technical Codes*).

G104.5 Suspension or revocation. The building official is authorized to suspend or revoke a permit issued under this appendix wherever the permit is issued in error or on the basis of incorrect, inaccurate, or incomplete information, or in violation of any ordinance or code of the City of Austin.

SECTION G105 VARIANCES

G105.1 General. The City Council shall decide requests for variances from the floodplain regulations in this code and in City Code Chapter 25-7 (*Drainage*) after conducting a public hearing. The City Council shall base its determination on technical justifications, and has the right to attach such conditions to variances as it deems necessary to further the purposes and objectives of this appendix and Section 1612 (*Flood Loads*).

G105.2 Records. The building official shall maintain a permanent record of all variance actions, including justification for their issuance.

G105.3 Historic structures. A variance may be issued for the repair or rehabilitation of a historic structure upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure, and the variance is the minimum necessary to preserve the historic character and design of the structure.

Exception: Within flood hazard areas, historic structures that are not:

- a. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places; or
- b. Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or
- c. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.

G105.4 Functionally dependent facilities. A variance may be issued for the construction or substantial improvement of a functionally dependent facility provided the criteria in Section 1612.1 (*General*) are met and the variance is the minimum necessary to allow the construction or substantial improvement, and that all due consideration has been given to methods and materials that minimize flood damages during the design flood and create no additional threats to public safety.

1 **G105.5 Restrictions.** The City Council shall not issue a variance for any proposed
2 development in a floodway if any increase in flood levels would result during the design
3 flood discharge.

4 **G105.6 Considerations.** In reviewing applications for variances, the City Council shall
5 consider all technical evaluations, all relevant factors, all other portions of this appendix,
6 and each of the following:

- 7 1. The danger that materials and debris may be swept onto other lands resulting
8 in further injury or damage.
- 9 2. The danger to life and property due to flooding or erosion damage.
- 10 3. The susceptibility of the proposed development, including contents, to flood
11 damage and the effect of such damage on current and future owners.
- 12 4. The importance of the services provided by the proposed development to the
13 community.
- 14 5. The availability of alternate locations for the proposed development that are
15 not subject to flooding or erosion.
- 16 6. The compatibility of the proposed development with existing and anticipated
17 development.
- 18 7. The relationship of the proposed development to the comprehensive plan
19 and flood plain management program for that area.
- 20 8. The safety of access to the property in times of flood for ordinary and
21 emergency vehicles.
- 22 9. The expected heights, velocity, duration, rate of rise and debris and sediment
23 transport of the floodwaters and the effects of wave action, if applicable,
24 expected at the site.
- 25 10. The costs of providing governmental services during and after flood
26 conditions including maintenance and repair of public utilities and facilities
27 such as sewer, gas, electrical and water systems, streets and bridges.

28 **G105.7 Conditions for issuance.** Variances shall only be issued by the City Council
29 upon:

- 30 1. A technical showing of good and sufficient cause based on the unique
31 characteristics of the size, configuration or topography of the site;
- 32 2. A determination that failure to grant the variance would result in exceptional
33 hardship by rendering the lot undevelopable;

3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, nor create nuisances, cause fraud on or victimization of the public or conflict with existing local laws or ordinances;
4. A determination that the variance is the minimum necessary, considering the flood hazard, to afford relief; and
5. Notification to the applicant in writing over the signature of the building official that the issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance, and that such construction below the base flood level increases risks to life and property.

SECTION G201 DEFINITIONS

G201.1 General. The following words and terms shall, for the purposes of this appendix, have the meanings shown herein. Refer to Chapter 2 for general definitions.

G201.2 Definitions.

DEVELOPMENT. Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, temporary or permanent storage of materials, mining, dredging, filling, grading, paving, excavation operations, and other land disturbing activities.

FUNCTIONALLY DEPENDENT FACILITY. A facility which cannot be used for its intended purpose unless it is located or carried out in close proximity to water, such as a docking or port facility necessary for the loading or unloading of cargo or passengers, shipbuilding or ship repair. The term does not include long-term storage, manufacture, sales or service facilities.

MANUFACTURED HOME. A structure that is transportable in one or more sections, built on a permanent chassis, designed for use with or without a permanent foundation when attached to the required utilities, and constructed to the Federal Mobile Home Construction and Safety Standards and rules and regulations promulgated by the U.S. Department of Housing and Urban Development. The term also includes mobile homes, park trailers, travel trailers, and similar transportable structures that are placed on a site for 180 consecutive days or longer.

MANUFACTURED HOME PARK OR SUBDIVISION. A parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

RECREATIONAL VEHICLE. A vehicle that is built on a single chassis, 400 square feet (37.16 m²) or less when measured at the largest horizontal projection, designed to be self-propelled or permanently towable by a light-duty truck, and designed primarily not

1 for use as a permanent dwelling but rather as temporary living quarters for recreational,
2 camping, travel, or seasonal use. A recreational vehicle is ready for highway use if it is
3 on its wheels or jacking system, is attached to the site only by quick disconnect-type
4 utilities and security devices, and has no permanently attached additions.

5 **VARIANCE.** A grant of relief from the requirements of the floodplain regulations in this
6 code and in City Code Chapter 25-7 (*Drainage*) which permits construction in a manner
7 otherwise prohibited by this section where specific enforcement would result in
8 unnecessary hardship.

9 **VIOLATION.** A development that is not fully compliant with this appendix or Section
10 1612 (*Flood Loads*), as applicable.

11 **SECTION G301 SUBDIVISIONS**

12 **G301.1 General.** Any subdivision proposal, including proposals for manufactured home
13 parks and subdivisions, or other proposed new development in a flood hazard area shall
14 be reviewed to assure that:

- 15 1. All such proposals are consistent with the need to minimize flood damage;
- 16 2. All public utilities and facilities, such as sewer, gas, electric and water
17 systems are located and constructed to minimize or eliminate flood damage;
18 and
- 19 3. Adequate drainage is provided to reduce exposure to flood hazards.

20 **G301.2 Subdivision requirements.** The following requirements shall apply in the case
21 of any proposed subdivision, including proposals for manufactured home parks and
22 subdivisions, any portion of which lies within a flood hazard area:

- 23 1. The flood hazard area, including floodways, as appropriate, shall be
24 delineated on tentative and final subdivision plats;
- 25 2. Design flood elevations shall be shown on tentative and final subdivision
26 plats;
- 27 3. Residential building lots shall be provided with adequate buildable area
28 outside the floodway; and
- 29 4. The design criteria for utilities and facilities set forth in this appendix,
30 Section 1612 of ASCE 24, the City of Austin Drainage Criteria Manual, and
31 applicable FEMA design criteria shall be met.

32 **SECTION G401 SITE IMPROVEMENT**

G401.1 Development in floodways. Development or land disturbing activity shall not be authorized in the floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed and sealed by a Professional Engineer licensed by the State of Texas in accordance with the City of Austin Drainage Criteria Manual that the proposed encroachment will not result in any increase in the level of the design flood.

G401.2 Sewer facilities. All new or replaced sanitary sewer facilities, private sewage treatment plants (including all pumping stations and collector systems) and on-site waste disposal systems shall be designed in accordance with Chapter 7, ASCE 24, to minimize or eliminate infiltration of floodwaters into the facilities and discharge from the facilities into floodwaters, or impairment of the facilities and systems.

G401.43 Water facilities. All new replacement water facilities shall be designed in accordance with the provisions of Chapter 7, ASCE 24, to minimize or eliminate infiltration of floodwaters into the systems.

G401.54 Storm drainage. Storm drainage shall be designed to convey the flow of surface waters to minimize or eliminate damage to persons or property.

G401.65 Streets and sidewalks. Streets and sidewalks shall be designed to minimize potential for increasing or aggravating flood levels.

SECTION G501 MANUFACTURED HOMES

G501.1 Elevation. All new and replacement manufactured homes to be placed or substantially improved in a flood hazard area shall be elevated such that the lowest floor of the manufactured home is elevated to a minimum of one (1) foot above the design flood elevation. Elevation certification required by Section 1612.5 (*Flood hazard documentation*) shall be submitted to the building official.

G501.2 Foundations. All new and replacement manufactured homes, including substantial improvement of existing manufactured homes, shall be placed on a permanent, reinforced foundation that is designed in accordance with Section 1612 (*Flood Loads*).

G501.3 Anchoring. All new and replacement manufactured homes to be placed or substantially improved in a flood hazard area shall be installed using methods and practices which minimize flood damage. Manufactured homes shall be securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement. Methods of anchoring are authorized to include, but are not limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable state and local anchoring requirements for resisting wind forces.

SECTION G601 RECREATIONAL VEHICLES

G601.1 Placement prohibited. The placement of recreational vehicles shall not be authorized in floodways.

G601.2 Temporary placement. Recreational vehicles in flood hazard areas shall be fully licensed and ready for highway use, and may be placed on a site for no more than 180 consecutive days.

G601.3 Permanent placement. Recreational vehicles that are not fully licensed and ready for highway use, or that are to be placed on a site for more than 180 consecutive days, shall meet the requirements of Section G501(*Manufactured Homes*).

SECTION G701 TANKS

G701.1 Underground tanks. Underground tanks in flood hazard areas shall be anchored to prevent flotation, collapse or lateral movement resulting from hydrostatic loads, including the effects of buoyancy, during conditions of the design flood.

G701.2 Above-ground tanks. Above-ground tanks in flood hazard areas shall be elevated to or above the design flood elevation or shall be anchored or otherwise designed and constructed to prevent flotation, collapse or lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, during conditions of the design flood.

G701.3 Tank inlets and vents. In flood hazard areas, tank inlets, fill openings, outlets and vents shall be:

1. At or above the design flood elevation or fitted with covers designed to prevent the inflow of floodwater or outflow of the contents of the tanks during conditions of the design flood.
2. Anchored to prevent lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, during conditions of the design flood.

SECTION G702 REFERENCED STANDARDS

ASCE 24-05	Flood Resistance Design And Construction	G103.1 G401.3, G401.4
HUD 24 CFR	Manufactured Home	G201
Part 3280-94	Construction and Safety Standards, 1994	
IBC-2012	International Building Code	G102.2

PART 2. This ordinance takes effect on September 16, 2013.

PASSED AND APPROVED

_____, 2013 § _____
 § _____
 § _____
 Lee Leffingwell
 Mayor

APPROVED: _____ **ATTEST:** _____
 Karen M. Kennard Jannette S. Goodall
 City Attorney City Clerk