APPENDIX C
CODE CHANGE PROPOSAL
NORTH CAROLINA
BUILDING CODE COUNCIL

B-4

325North Salisbury Street, Room 5_44
Raleigh, North Carolina 27603
(919) 647-0009
carl.martin@ncdoi.gov

Petition for Rule Making Item Number _____

Granted by BCC	_____	**Adopted by BCC**	_____	**Approved by RRC**	_____
Denied by BCC	_____	**Disapproved by BCC**	_____	**Objection by RRC**	_____

PROPONENT: BCC Building/Fire Ad-Hoc Committee PHONE: (919)888-0284
REPRESENTING: BCC Building/Fire Ad-Hoc Committee
ADDRESS: Mail Service Center 1202
CITY: Raleigh STATE: NC ZIP: 27699-1202
E-MAIL: carl.martin@ncdoi.gov FAX: ( ) -

North Carolina State Building Code, Volume 2024 Fire Code - Section

CHECK ONE: [ ] Revise section to read as follows: [ ] Delete section and substitute the following:
[X] Add new section to read as follows: [ ] Delete section without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED~~ UNDERLINE MATERIAL TO BE ADDED

Please type. Continue proposal or reason on plain paper attached to this form. See reverse side for instructions.

The 2024 NCBC is based on the 2021 IFC which can be viewed at: Digital Codes (iccsafe.org)
The NC amendments to the 2021 IFC that make up the 2024 NCFC are shown in ATTACHMENT A below.

Will this proposal change the cost of construction?	Decrease [ ]	Increase [ ]	No	[X]
Will this proposal increase to the cost of a dwelling by $80 or more?		Yes [ ]	No	[X]
Will this proposal affect the Local or State funds?	Local [ ]	State [ ]	No	[X]
Will this proposal cause a substantial economic impact (≥$1,000,000)?		Yes [ ]	No	[X]

- Non-Substantial – Provide an economic analysis including benefit/cost estimates.
- Substantial – The economic analysis must also include 2-alternatives, time value of money and risk analysis.
- Pursuant to §143-138(a1)(2) a cost-benefit analysis is required for all proposed amendments to the NC Energy Conservation Code. The Building Code Council shall also require same for the NC Residential Code, Chapter 11.

REASON: This amendment is proposed to protect the public by updating the code to current standards of practice.

Signature: *CARL MARTIN* Date: November 1, 2022

ATTACHMENT A

THIS DOCUMENT CONTAINS PROPOSED NORTH CAROLINA AMENDMENTS TO THE 2021 EDITION OF THE INTERNTATIONAL FIRE CODE (IFC) FOR THE PURPOSE OF ESTABLISHING THE 2024 EDITION OF THE NORTH CAROLINA FIRE CODE.

UNDERLINED TEXT INDICATE NORTH CAROLINA PROPOSED AMENDMENTS TO THE 2021 INTERNATIONAL IFC FOR THE 2024 NORTH CAROLINA FIRE CODE.

S~~TRUCKTHROUGH~~ TEXT INDICATES IFC TEXT THAT IS PROPOSED TO BE REMOVED FROM THE 2024 NORTH CAROLINA FIRE CODE.

TEXT THAT IS HIGHLIGHTED IN YELLOW INDICATES PROPOSED NORTH CAROLINA AMENDMENTS THAT ARE NEW OR DIFFERRENT THAN THE 2018 NORTH CAROLINA FIRE CODE.

Part I—Administrative

CHAPTER 1
SCOPE AND ADMINISTRATION

~~**User note:**~~

~~***About this chapter:*** *Chapter 1 establishes the limits of applicability of the code and describes how the code is to be applied and enforced. Chapter 1 is in two parts: Part 1—General Provisions (Sections 101–102) and Part 2—Administrative Provisions (Sections 103–114). Section 102 identifies which buildings and structures come under its purview and references other I-Codes as applicable.*~~

~~*This code is intended to be adopted as a legally enforceable document, and it cannot be effective without adequate provisions for its administration and enforcement. The provisions of Chapter 1 establish the authority and duties of the code official appointed by the authority having jurisdiction and also establish the rights and privileges of the design professional, contractor and property owner.*~~

~~***Code development reminder:*** *Code change proposals to this chapter will be considered by the Administrative Code Development Committee during the 2022 (Group B) Code Development Cycle.*~~

~~*Portions of this chapter were extensively reorganized for the 2021 edition. For clarity, the relocation marginal markings have not been included. For complete information, see the relocations table in the preface information of this code.*~~

PART 1—GENERAL PROVISIONS

SECTION 101
SCOPE AND GENERAL REQUIREMENTS

[A] 101.1 Title. These regulations shall be known as the *North Carolina Fire Code* ~~of **[NAME OF JURISDICTION],** herein after referred to as "this code."~~ as adopted by the North Carolina Building Code Council on September 12, 2022 to be effective January 1, 2025. References to the *International Code* shall mean the North Carolina Codes. The North Carolina amendments to the *International Code* are underlined.

[A] 101.2 Scope. This code establishes regulations affecting or relating to structures, processes, premises and safeguards regarding all of the following:

1. The hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices.
2. Conditions hazardous to life, property or public welfare in the occupancy of structures or premises.
3. Fire hazards in the structure or on the premises from occupancy or operation.
4. Matters related to the construction, extension, repair, *alteration* or removal of fire protection systems.
5. Conditions affecting the safety of fire fighters and emergency responders during emergency operations.

[A] 101.2.1 Appendices. Provisions in the appendices shall not be enforceable unless specifically adopted by the local governing authority having jurisdiction and subsequently approved for use by the Building Code Council.

Exception: Appendix H is adopted and enforceable.

[A] 101.3 Intent ~~Purpose~~. The intent ~~purpose~~ of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises, and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

101.6 Requirements of other State agencies, occupational licensing boards or commissions. The North Carolina State Building Codes do not include all additional requirements for buildings and structures that may be imposed by other State agencies, occupational licensing boards and commissions. It shall be the responsibility of a permit holder, design professional, contractor or occupational license holder to determine whether any additional requirements exist.

SECTION 102
APPLICABILITY

[A] 102.1 Construction and design provisions. The construction and design provisions of this code shall apply to:

1. Structures, facilities and conditions arising after the adoption of this code.
2. Existing structures, facilities and conditions not legally in existence at the time of adoption of this code.
3. ~~Existing structures, facilities and conditions where required in Chapter 11.~~ The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as specifically covered in this code or the *International Building Code*, or when there exists a distinct hazard to life or property.
4. ~~Existing structures, facilities and conditions that, in the opinion of the *fire code official*, constitute a distinct hazard to life or property.~~

~~**[A] 102.3 Change of use or occupancy.** A change of occupancy shall not be made unless the use or occupancy is made to comply with the requirements of this code and the *International Existing Building Code*.~~

~~**Exception:** Where *approved* by the *fire code official*, a change of occupancy shall be permitted without complying with the requirements of this code and the *International Existing Building Code*, provided that the new or proposed use or occupancy is less hazardous, based on life and fire risk, than the existing use or occupancy.~~

[A] 102.3 Change of use or occupancy. The provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes shall apply to all buildings undergoing a change of occupancy.

[A] 102.4 Application of building code. The design and construction of new structures shall comply with the *International Building Code*, and any *alterations*, additions, changes in use or changes in structures required by this code, which are within the scope of the *International Building Code* or the *International Existing Building Code*, shall be made in accordance therewith.

[A] 102.6 Historic buildings. The provisions of this code relating to the construction, *alteration*, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings where such buildings or structures do not constitute a distinct hazard to life or property. Fire protection in designated historic buildings shall be provided with an *approved* fire protection plan ~~as required in Section 1103.1.1~~ in accordance with NFPA 914. The fire protection plans shall comply with the maintenance and availability provisions in Sections 404.3 and 404.4.

[[A] 102.9 Matters not provided for. Requirements that are essential for the public safety of an existing or proposed activity, building or structure, or for the safety of the occupants thereof, that are not specifically provided for by this code, ~~shall be determined by the *fire code official*.~~ shall comply with N.C.G.S. 58-79-20.

102.13 Exception to applicability. The provisions of this code shall not apply to the following:

1. Occupancy of one- and two-family dwellings.

2. Farm buildings not used for:

   a. Sleeping purposes; or

   b. Storage of hazardous materials in excess of those listed in Tables 5003.1.1(1) and 5003.1.1(2) within the building rules jurisdiction of any municipality.

3. The design, construction, location, installation, or operation of equipment for storing, handling, and transporting liquefied petroleum gases for fuel purposes up to the first stage regulator, liquefied natural gases, and anhydrous ammonia or other liquid fertilizers.

4. The design, construction, location, installation or operation of equipment or facilities of a public utility, as defined in N.C.G.S. 62-3, or an electric or telephone membership corporation, including without limitation poles, towers and other structures supporting electric or communication lines from the distribution network up to the meter location.

   Exception: All buildings owned and operated by a public utility or an electric or telephone membership corporation shall meet the provisions of the code.

5. The storage and handling of substances governed by the Hazardous Chemicals Right to Know Act in N.C.G.S. Chapter 95, Article 18.

6. Open burning pursuant to N.C.G.S. 106-940 through 106-950 under the jurisdiction of the North Carolina Department of Agriculture and Consumer Services.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION 103
~~CODE COMPLIANCE AGENCY~~ DEPARTMENT OF FIRE PREVENTION

[A] 103.1 General ~~Creation of agency.~~ ~~The **[INSERT NAME OF DEPARTMENT]** is hereby created and the official in charge thereof shall be known as the *fire code official*. The function of the agency shall be the implementation, administration and enforcement of the provisions of this code.~~ The department of fire prevention is established within the jurisdiction under the direction of the *fire code official.* The function of the department shall be the implementation, administration and enforcement of the provisions of this code.

~~**[A] 103.2 Appointment.** The *fire code official* shall be appointed by the chief appointing authority of the jurisdiction.~~

[A] 103.2 Appointment. See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

~~**[A] 103.3 Deputies.** In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the *fire code official* shall have the authority to appoint a deputy *fire code official*, other related technical officers, inspectors and other employees. Such employees shall have powers as delegated by the *fire code official*.~~

[A] 103.3 Deputies. See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

SECTION 104
DUTIES AND POWERS OF THE FIRE CODE OFFICIAL

~~**[A] 104.3 Right of entry.** Where it is necessary to make an inspection to enforce the provisions of this code, or where the *fire code official* has reasonable cause to believe that there exists in a building or on any premises any conditions or violations of this code that make the building or premises unsafe, dangerous or hazardous, the *fire code official* shall have the authority to enter the building or premises at all reasonable times to inspect or to perform the duties imposed on the *fire code official* by this code. If such building or premises is occupied, the *fire code official* shall present credentials to the occupant and request entry. If such building or premises is unoccupied, the *fire code official* shall first make a reasonable effort to locate the *owner*, the *owner's* authorized agent or other person having charge or control of the building or premises and request entry. If entry is refused, the *fire code official* has recourse to every remedy provided by law to secure entry.~~

[A] 104.3 Right of entry. See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

~~**[A] 104.3.1 Warrant.** Where the *fire code official* has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an *owner*, the *owner's* authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the *fire code official* for the purpose of inspection and examination pursuant to this code.~~

[A] 104.3.1 Warrant. See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

~~**[A] 104.4 Identification.** The *fire code official* shall carry proper identification when inspecting structures or premises in the performance of duties under this code.~~

[A] 104.4 Identification. See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

~~**[A] 104.5 Notices and orders.** The *fire code official* is authorized to issue such notices or orders as are required to affect compliance with this code in accordance with Sections 112.1 and 112.2.~~

[A] 104.5 Notices and orders. See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

~~**[A] 104.6 Official records.** The *fire code official* shall keep official records as required by Sections 104.6.1 through 104.6.4. Such official records shall be retained for not less than 5 years or for as long as the structure or activity to which such records relate remains in existence, unless otherwise provided by other regulations.~~

~~**[**~~**A] 104.6 Official records.** The *fire code official* shall keep official records as required by the North Carolina Department of Natural and Cultural Resources. ~~Sections 104.6.1 through 104.6.4. Such official records shall be retained for not less than 5 years or for as long as the structure or activity to which such records relate remains in existence, unless otherwise provided by other regulations.~~

[A] 104.6 Official records. See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

~~**[A] 104.6.1 Approvals.** A record of approvals shall be maintained by the *fire code official* and shall be available for public inspection during business hours in accordance with applicable laws.~~

~~**[A] 104.6.2 Inspections.** The *fire code official* shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.~~

~~**104.6.3 Fire records.** The fire department shall keep a record of fires occurring within its jurisdiction and of facts concerning the same, including statistics as to the extent of such fires and the damage caused thereby, together with other information as required by the *fire code official*.~~

~~**[A] 104.6.4 Administrative.** Application for modification, alternative methods or materials and the final decision of the *fire code official* shall be in writing and shall be officially recorded in the permanent records of the *fire code official*.~~

~~**[A] 104.7 Liability.** The *fire code official*, member of the board of appeals, officer or employee charged with the enforcement of this code, while acting for the jurisdiction, in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered civilly or criminally liable personally, and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of an act or by reason of an act or omission in the discharge of official duties.~~

[A] 103.4 Liability. See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

~~**[A] 104.7.1 Legal defense.** Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representatives of the jurisdiction until the final termination of the proceedings. The *fire code official* or any subordinate shall not be liable for costs in an action, suit or proceeding that is instituted in pursuance of the provisions of this code; and any officer of the department of fire prevention, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.~~

[A] 103.4.1 Legal defense. See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

~~**[A] 104.9 Modifications.** Where there are practical difficulties involved in carrying out the provisions of this code, the *fire code official* shall have the authority to grant modifications for individual cases, provided that the *fire code official* shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety requirements. The details of action granting modifications shall be recorded and entered in the files of the department of fire prevention.~~

[A] 104.9 Modifications. See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

~~**[A] 104.10 Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *fire code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability and safety. Where the alternative material, design or method of construction is not *approved*, the *fire code official* shall respond in writing, stating the reasons why the alternative was not *approved*.~~

~~**[A] 104.10.1 Research reports.** Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.~~

~~**[A] 104.10.2 Tests.** Where there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the *fire code official* shall have the authority to require tests as evidence of compliance to be made without expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *fire code official* shall approve the testing procedures. Tests shall be performed by an *approved* agency. Reports of such tests shall be retained by the *fire code official* for the period required for retention of public records.~~

[A] 104.10 Alternative materials and methods. See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

~~**104.11 Fire investigations.** The *fire code official*, the fire department or other responsible authority shall have the authority to investigate the cause, origin and circumstances of any fire, explosion or other hazardous condition. Information that could be related to trade secrets or processes shall not be made part of the public record, except as directed by a court of law.~~

~~**104.11.1 Assistance from other agencies.** Police and other enforcement agencies shall have authority to render necessary assistance in the investigation of fires when requested to do so.~~

104.11 *Fire investigations.* *See the provisions of the North Carolina Administrative Code and Policies and applicable North* Carolina General Statutes.

104.11 *Fire investigations.* See North Carolina General Statutes 58-79-1 and 58-2-95.

SECTION 105
PERMITS

105.1.2 Types of permits. There shall be two types of permits as follows:

1. Operational permit. An operational permit allows the applicant to conduct an operation or a business for which a permit is required by Section 105.5 for either:
   1.1. A prescribed period.
   1.2. Until renewed or revoked.
2. Construction permit. A construction permit allows the applicant to install or modify systems and equipment for which a permit is required by Section 105.6.

105.1.2.1 Operational Permits. Operational permits listed as mandatory in Section 105.~~6~~ 5 shall be obtained from the fire code official. For decisions on any appeals of the provisions of mandatory permits, see the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes. Permits are not transferable and any change in occupancy, operation, tenancy, or ownership shall require a new permit to be issued.

Operational permits listed as optional in Section 105.~~6~~ 5 must be adopted by local ordinance to be legally issued by the fire code official. A permit listed as optional does not make any of the technical provisions of this code optional.

~~**[A] 105.1.6 Annual permit.** Instead of an individual construction permit for each alteration to an already *approved* system or equipment installation, the *fire code official* is authorized to issue an annual permit on application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure or on the premises owned or operated by the applicant for the permit.~~

~~**[A] 105.1.6.1 Annual permit records.** The person to whom an annual permit is issued shall keep a detailed record of alterations made under such annual permit. The *fire code official* shall have access to such records at all times or such records shall be filed with the *fire code official* as designated.~~

[A] 105.2.3 Time limitation of application for operational permit. An application for a permit for any proposed work or operation shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been diligently prosecuted or a permit shall have been issued; except that the *fire code official* is authorized to grant one or more extensions of time for additional periods not exceeding 90 days each. The extension shall be requested in writing and justifiable cause demonstrated.

[A] 105.2.3.1 Time limitation of application for construction permit. See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

~~**[A] 105.3.1 Expiration.** An operational permit shall remain in effect until reissued, renewed or revoked, or for such a period of time as specified in the permit. Construction permits shall automatically become invalid unless the work authorized by such permit is commenced within 180 days after its issuance, or if the work authorized by such permit is suspended or abandoned for a period of 180 days after the time the work is commenced. Before such work recommences, a new permit shall be first obtained and the fee to recommence work, if any, shall be one-half the amount required for a new permit for such work, provided that changes have not been made and will not be made in the original *construction documents* for such work, and provided further that such suspension or abandonment has not exceeded one year. Permits are not transferable and any change in occupancy, operation, tenancy or ownership shall require that a new permit be issued.~~

~~**[A] 105.3.1 Expiration.** An operational permit shall remain in effect until reissued, renewed or revoked or for such a time as prescribed in the permit. Permits are not transferable and any change in occupancy, operation, tenancy, or ownership shall require a new permit to be issued.~~

[A] 105.3.2 Extensions of operational permits. A permittee holding an unexpired permit shall have the right to apply for an extension of the time within which the permittee will commence work under that permit where work is unable to be commenced within the time required by this section for good and satisfactory reasons. The *fire code official* is authorized to grant, in writing, one or more extensions of the time period of a permit for periods of not more than 180 days each. Such extensions shall be requested by the permit holder in writing and justifiable cause demonstrated.

[A] 105.3.6 Compliance with code. The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a permit based on *construction documents* and other data shall not prevent the *fire code official* from requiring the correction of errors in the *construction documents* and other data. ~~Any addition to or alteration of *approved construction documents* shall be *approved* in advance by the *fire code official*, as evidenced by the issuance of a new or amended permit.~~ Work shall not deviate substantially from that described on the permit documents unless prior approval is obtained from the *registered design professional* and *fire code official*.

~~**[A] 105.3.8 Validity of permit.** The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other ordinances of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a permit based on *construction documents*, operational documents and other data shall not prevent the *fire code official* from requiring correction of errors in the documents or other data.~~

[A] 105.3.8 Validity of permit. See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

105.5.1 Additive manufacturing (mandatory permit). An operational permit is required to conduct additive manufacturing operations regulated by Section 320.3.

105.5.2 Aerosol products, aerosol cooking spray products, and plastic aerosol 3 products (optional permit). An operational permit is required to manufacture, store or handle an aggregate quantity of Level 2 or Level 3 aerosol products, aerosol cooking spray products or plastic aerosol 3 products in excess of 500 pounds (227 kg) net weight.

105.5.3 Amusement buildings (mandatory permit). An operational permit is required to operate a special amusement building.

105.5.4 Aviation facilities (optional permit). An operational permit is required to use a Group H or Group S occupancy for aircraft servicing or repair and aircraft fuel-servicing vehicles. Additional permits required by other sections of this code include, but are not limited to, hot work, hazardous materials and flammable or combustible finishes.

105.5.5 Carnivals and fairs (mandatory permit). An operational permit is required to conduct a carnival or fair.

105.5.6 Cellulose nitrate film (optional permit). An operational permit is required to store, handle or use cellulose nitrate film in a Group A occupancy.

105.5.7 Combustible dust-producing operations (mandatory permit). An operational permit is required to operate a grain elevator, flour starch mill, feed mill, or a plant pulverizing aluminum, coal, cocoa, magnesium, spices or sugar, or other operations producing *combustible dusts* as defined in Chapter 2.

105.5.8 Combustible fibers (optional permit). An operational permit is required for the storage and handling of *combustible fibers* in quantities greater than 100 cubic feet (2.8 m^3).

Exception: A permit is not required for agricultural storage.

105.5.9 Compressed gases (optional permit). An operational permit is required for the storage, use or handling at *normal temperature and pressure* (NTP) of *compressed gases* in excess of the amounts listed in Table 105.5.9.

Exception: Vehicles equipped for and using *compressed gas* as a fuel for propelling the vehicle.

TABLE 105.5.9
PERMIT AMOUNTS FOR COMPRESSED GASES

TYPE OF GAS	AMOUNT (cubic feet at NTP)
Carbon dioxide used in carbon dioxide enrichment systems	875 (100 lb)
Carbon dioxide used in insulated liquid carbon dioxide beverage dispensing applications	875 (100 lb)
Corrosive	200
Flammable (except cryogenic fluids and liquefied petroleum gases)	200
Highly toxic	Any Amount
Inert and simple asphyxiant	6,000
Oxidizing (including oxygen)	504
Pyrophoric	Any Amount
Toxic	Any Amount

For SI: 1 cubic foot = 0.02832 m^3.

105.5.10 Covered and open mall buildings (mandatory permit). An operational permit is required for:

1. The placement of retail fixtures and displays, concession equipment, displays of highly combustible goods and similar items in the mall.
2. The display of liquid- or gas-fired equipment in the mall.

3. The use of open-flame or flame-producing equipment in the mall.

105.5.11 Cryogenic fluids (optional permit). An operational permit is required to produce, store, transport on site, use, handle or dispense *cryogenic fluids* in excess of the amounts listed in Table 105.5.11.

Exception: Permits are not required for vehicles equipped for and using *cryogenic fluids* as a fuel for propelling the vehicle or for refrigerating the lading.

TABLE 105.5.11
PERMIT AMOUNTS FOR CRYOGENIC FLUIDS

TYPE OF CRYOGENIC FLUID	INSIDE BUILDING (gallons)	OUTSIDE BUILDING (gallons)
Flammable	More than 1	60
Inert	60	500
Oxidizing (includes oxygen)	10	50
Physical or health hazard not indicated above	Any Amount	Any Amount

For SI: 1 gallon = 3.785 L.

105.5.12 Cutting and welding (optional permit). An operational permit is required to conduct cutting or welding operations within the jurisdiction.

105.5.13 Dry cleaning (optional permit). An operational permit is required to engage in the business of dry cleaning or to change to a more hazardous cleaning solvent used in existing dry cleaning equipment.

105.5.14 Energy storage systems (mandatory permit). An operational permit is required for stationary and mobile energy storage systems regulated by Section 1207.

105.5.15 Exhibits and trade shows (mandatory permit). An operational permit is required to operate exhibits and trade shows.

105.5.16 Explosives (mandatory permit). An operational permit is required for the manufacture, storage, handling, sale or use of any quantity of *explosives*, *explosive materials*, fireworks or pyrotechnic special effects within the scope of Chapter 56.

Exceptions:

1. Fireworks allowed by North Carolina N.C.G.S. 14-414.
2. Storage in Group R-3 occupancies of smokeless propellant, black powder and small arms primers for personal use, not for resale and in accordance with Section 5606.

105.5.17 Fire hydrants and valves (optional permit). An operational permit is required to use or operate fire hydrants or valves intended for fire suppression purposes that are installed on water systems and provided with ready access from a fire apparatus access road that is open to or generally used by the public.

Exception: A permit is not required for authorized employees of the water company that supplies the system or the fire department to use or operate fire hydrants or valves.

105.5.18 Flammable and combustible liquids. An operational permit is required:

1. **Optional permit.** To use or operate a pipeline for the transportation within facilities of *flammable* or *combustible liquids*. This requirement shall not apply to the off-site transportation in pipelines regulated by the Department of Transportation (DOTn) nor does it apply to piping systems.
2. **Optional permit.** To store, handle or use Class I liquids in excess of 5 gallons (19 L) in a building or in excess of 10 gallons (37.9 L) outside of a building, except that a permit is not required for the following:

2.1. The storage or use of Class I liquids in the fuel tank of a motor vehicle, aircraft, motorboat, mobile power plant or mobile heating plant, unless such storage, in the opinion of the *fire code official*, would cause an unsafe condition.

2.2. The storage or use of paints, oils, varnishes or similar flammable mixtures where such liquids are stored for maintenance, painting or similar purposes for a period of not more than 30 days.

3. **Optional permit.** To store, handle or use Class II or Class IIIA liquids in excess of 25 gallons (95 L) in a building or in excess of 60 gallons (227 L) outside a building, except for fuel oil used in connection with oil-burning equipment.

4. **Optional permit.** To store, handle or use Class IIIB liquids in tanks or portable tanks for fueling motor vehicles at motor fuel-dispensing facilities or where connected to fuel-burning equipment.

   Exception: Fuel oil and used motor oil used for space heating or water heating.

5. **Optional permit.** To remove Class I or II liquids from an underground storage tank used for fueling motor vehicles by any means other than the *approved*, stationary on-site pumps normally used for dispensing purposes.

6. **Mandatory permit.** To operate tank vehicles, equipment, tanks, plants, terminals, wells, fuel-dispensing stations, refineries, distilleries and similar facilities where *flammable* and *combustible liquids* are produced, processed, transported, stored, dispensed or used.

7. **Mandatory permit.** To place temporarily out of service (for more than 90 days) an underground, protected above-ground or above-ground *flammable* or *combustible liquid* tank.

8. **Mandatory permit.** To change the type of contents stored in a *flammable* or *combustible liquid* tank to a material that poses a greater hazard than that for which the tank was designed and constructed.

9. **Mandatory permit.** To manufacture, process, blend or refine *flammable* or *combustible liquids*.

10. **Mandatory permit.** To engage in the dispensing of liquid fuels into the fuel tanks of motor vehicles at commercial, industrial, governmental or manufacturing establishments in accordance with Section 5706.5.4 or to engage in on-demand mobile fueling operations in accordance with Section 5707.

11. **Mandatory permit.** To utilize a site for the dispensing of liquid fuels from tank vehicles into the fuel tanks of motor vehicles, marine craft and other special equipment at commercial, industrial, governmental or manufacturing establishments in accordance with Section 5706.5.4 or, where required by the *fire code official*, to utilize a site for on-demand mobile fueling operations in accordance with Section 5707.

105.5.19 Floor finishing (optional permit). An operational permit is required for floor finishing or surfacing operations exceeding 350 square feet (33 m^2) using Class I or Class II liquids.

105.5.20 Fruit and crop ripening (optional permit). An operational permit is required to operate a fruit- or crop-ripening facility or conduct a fruit-ripening process using ethylene gas.

105.5.21 Fumigation and insecticidal fogging (optional permit). An operational permit is required to operate a business of fumigation or insecticidal fogging, and to maintain a room, vault or chamber in which a toxic or flammable fumigant is used.

105.5.22 Hazardous materials (optional permit). An operational permit is required to store, transport on site, dispense, use or handle hazardous materials in excess of the amounts listed in Table 105.5.22.

TABLE 105.5.22
PERMIT AMOUNTS FOR HAZARDOUS MATERIALS

TYPE OF MATERIAL	AMOUNT
Combustible liquids	See Section 105.5.18
Corrosive materials	
Gases	See Section 105.5.9
Liquids	55 gallons
Solids	1,000 pounds

Explosive materials	See Section 105.5.16
Flammable materials Gases Liquids Solids	 See Section 105.5.9 See Section 105.5.18 100 pounds
Highly toxic materials Gases Liquids Solids	 See Section 105.5.9 Any Amount Any Amount
Organic peroxides Liquids Class I Class II Class III Class IV Class V Solids Class I Class II Class III Class IV Class V	 Any Amount Any Amount 1 gallon 2 gallons No Permit Required Any Amount Any Amount 10 pounds 20 pounds No Permit Required
Oxidizing materials	
Gases	See Section 105.5.9
Liquids Class 4 Class 3 Class 2 Class 1	 Any Amount 1 gallon[a] 10 gallons 55 gallons
Solids Class 4 Class 3 Class 2 Class 1	 Any Amount 10 pounds[b] 100 pounds 500 pounds

Pyrophoric materials	
Gases	Any Amount
Liquids	Any Amount
Solids	Any Amount
Toxic materials	
Gases	See Section 105.5.9
Liquids	10 gallons
Solids	100 pounds

(continued)

TABLE 105.5.22—continued
PERMIT AMOUNTS FOR HAZARDOUS MATERIALS

TYPE OF MATERIAL	AMOUNT
Unstable (reactive) materials	
Liquids	
Class 4	Any Amount
Class 3	Any Amount
Class 2	5 gallons
Class 1	10 gallons
Solids	
Class 4	Any Amount
Class 3	Any Amount
Class 2	50 pounds
Class 1	100 pounds
Water-reactive materials	
Liquids	
Class 3	Any Amount
Class 2	5 gallons
Class 1	55 gallons
Solids	
Class 3	Any Amount
Class 2	50 pounds
Class 1	500 pounds

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

a. 22 gallons where Table 5003.1.1(1) Note k applies and hazard identification signs in accordance with Section 5003.5 are provided for quantities of 22 gallons or less.

b. 220 pounds where Table 5003.1.1(1) Note k applies and hazard identification signs in accordance with Section 5003.5 are provided for quantities of 220 pounds or less.

105.5.23 HPM facilities (optional permit). An operational permit is required to store, handle or use hazardous production materials.

105.5.24 High-piled storage (mandatory permit). An operational permit is required to use a building or portion thereof with more than 500 square feet (46 m^2), including aisles, of *high-piled combustible storage*.

105.5.25 Hot work operations (optional permit). An operational permit is required for hot work including, but not limited to:

1. Public exhibitions and demonstrations where hot work is conducted.
2. Use of portable hot work equipment inside a structure.

   Exception: Work that is conducted under a construction permit.
3. Fixed-site hot work equipment, such as welding booths.
4. Hot work conducted within a wildfire risk area.
5. Application of roof coverings with the use of an open-flame device.
6. Where *approved*, the *fire code official* shall issue a permit to carry out a hot work program. This program allows *approved* personnel to regulate their facility's hot work operations. The *approved* personnel shall be trained in the fire safety aspects denoted in this chapter and shall be responsible for issuing permits requiring compliance with the requirements found in Chapter 35. These permits shall be issued only to their employees or hot work operations under their supervision.

105.5.26 Industrial ovens (optional permit). An operational permit is required for operation of industrial ovens regulated by Chapter 30.

105.5.27 Lumber yards and woodworking plants (optional permit). An operational permit is required for the storage or processing of lumber exceeding 100,000 board feet (8,333 ft^3) (236 m^3).

105.5.28 Liquid- or gas-fueled vehicles or equipment in assembly buildings (mandatory permit). An operational permit is required to display, operate or demonstrate liquid- or gas-fueled vehicles or equipment in assembly buildings.

~~**105.5.29 LP-gas.** An operational permit is required for:~~

~~1. Storage and use of LP-gas.~~

~~**Exception:** A permit is not required for individual containers with a 500-gallon (1893 L) water capacity or less or multiple container systems having an aggregate quantity not exceeding 500 gallons (1893 L), serving occupancies in Group R-3.~~

~~3. Operation of cargo tankers that transport LP-gas.~~

105.5.29 LP-gas. A permit may be required and issued by the North Carolina Department of Agriculture and Consumer Services for LP-gas equipment used for storage, handling, transporting, and utilizing liquefied petroleum gas for fuel purposes.

105.5.30 Magnesium (optional permit). An operational permit is required to melt, cast, heat treat or grind more than 10 pounds (4.54 kg) of magnesium.

105.5.31 Miscellaneous combustible storage (optional permit). An operational permit is required to store in any building or on any premises in excess of 2,500 cubic feet (71 m^3) gross volume of combustible empty packing cases, boxes, barrels or similar containers, combustible pallets, rubber tires, rubber, cork or similar combustible material.

105.5.32 Mobile food preparation vehicles (optional permit). A permit is required for *mobile food preparation vehicles* equipped with appliances that produce smoke or grease-laden vapors.

105.5.33 Motor fuel-dispensing facilities (mandatory permit). An operational permit is required for the operation of automotive, marine and fleet motor fuel-dispensing facilities.

105.5.34 Open burning (optional permit). An operational permit is required for the kindling or maintaining of an open fire or a fire on any public street, alley, road, or other public or private ground. Instructions and stipulations of the permit shall be complied with.

Exception: *Recreational fires.*

105.5.35 Open flames and torches (optional permit). An operational permit is required to remove paint with a torch, or to use a torch or open-flame device in a wildfire risk area.

105.5.36 Open flames and candles (optional permit). An operational permit is required to use open flames or candles in connection with assembly areas, dining areas of restaurants or drinking establishments.

105.5.37 Organic coatings (optional permit). An operational permit is required for any organic-coating manufacturing operation producing more than 1 gallon (4 L) of an organic coating in one day.

105.5.38 Outdoor assembly event (mandatory permit). An operational permit is required to conduct an *outdoor assembly event* where planned attendance exceeds 1,000 persons.

105.5.39 Places of assembly (optional permit). An operational permit is required to operate a place of assembly.

105.5.39.1 *Nightclubs* (mandatory permit). An operational permit is required to operate a *nightclub*.

105.5.40 Plant extraction systems (mandatory permit). An operational permit is required to use plant extraction systems.

105.5.41 Private fire hydrants (mandatory permit). An operational permit is required for the removal from service, use or operation of private fire hydrants.

Exception: A permit is not required for private industry with trained maintenance personnel, private fire brigade or fire departments to maintain, test and use private hydrants.

105.5.42 Pyrotechnic special effects material (mandatory permit). An operational permit is required for use and handling of pyrotechnic special effects material.

105.5.43 Pyroxylin plastics (optional permit). An operational permit is required for storage or handling of more than 25 pounds (11 kg) of cellulose nitrate (pyroxylin) plastics, and for the assembly or manufacture of articles involving pyroxylin plastics.

105.5.44 Refrigeration equipment (optional permit). An operational permit is required to operate a mechanical refrigeration unit or system regulated by Chapter 6.

105.5.45 Repair garages and motor fuel-dispensing facilities (optional permit). An operational permit is required for operation of repair garages.

105.5.46 Rooftop heliports (optional permit). An operational permit is required for the operation of a rooftop heliport.

105.5.47 Spraying or dipping (mandatory permit). An operational permit is required to conduct a spraying or dipping operation utilizing *flammable* or *combustible liquids*, or the application of combustible powders regulated by Chapter 24.

105.5.48 Storage of scrap tires and tire byproducts (optional permit). An operational permit is required to establish, conduct or maintain storage of scrap tires and tire byproducts that exceeds 2,500 cubic feet (71 m^3) of total volume of scrap tires, and for indoor storage of tires and tire byproducts.

105.5.49 Temporary membrane structures and tents (mandatory permit). An operational permit is required to operate ~~an~~ ~~air-supported~~ temporary *membrane structure*~~,~~ or a *temporary special event structure* having an area in excess of 400 square feet (37 m^2), or a *tent* having an area in excess of ~~400~~ 800 square feet (~~37~~ 74 m^2).

Exceptions:

1. *Tents* used exclusively for recreational camping purposes.
2. *Tents* open on all sides, which comply with all of the following:
    2.1. Individual *tents* having a maximum size of ~~700 square feet (65 m^2)~~ 1,800 square feet (167 m^2)

2.2. The aggregate area of multiple *tents* placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed ~~700 square feet (65 m^2)~~ 1,800 square feet (167 m^2)total.

2.3. A minimum clearance of 12 feet (3658 mm) to structures and other *tents* shall be provided.

3. Funeral tents and curtains or extensions attached thereto, when used for funeral services.

105.5.50 Tire-rebuilding plants (optional permit). An operational permit is required for the operation and maintenance of a tire-rebuilding plant.

105.5.51 Waste handling (optional permit). An operational permit is required for the operation of wrecking yards, junk yards and waste material-handling facilities.

105.5.52 Wood products (optional permit). An operational permit is required to store chips, hogged material, lumber or plywood in excess of 200 cubic feet (6 m^3). •

105.5.53 Temporary sleeping units for disaster relief workers (mandatory permit). An operational permit is required for operation of long-term temporary *sleeping units* for disaster relief workers.

[A] 105.6 Required construction permits. The *fire code official* is authorized to issue construction permits for work as set forth in Sections 105.6.1 through 105.6.24. Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit. See the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes for general information concerning construction permits.

[A] 105.6.1 Automatic fire-extinguishing systems. A construction permit is required for installation of or modification to an automatic fire-extinguishing system. ~~Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.~~

[A] 105.6.2 Compressed gases. Where the *compressed gases* in use or storage exceed the amounts listed in Table 105.5.9, a construction permit is required to install, repair damage to, abandon, remove, place temporarily out of service, or close or substantially modify a *compressed gas* system.

~~**Exceptions:**~~

~~1. Routine maintenance.~~

~~2. For emergency repair work performed on an emergency basis, application for permit shall be made within two working days of commencement of work.~~

[A] 105.6.3 Cryogenic fluids. A construction permit is required for installation of or *alteration* to outdoor stationary *cryogenic fluid* storage systems where the system capacity exceeds the amounts listed in Table 105.5.11. ~~Maintenance performed in accordance with this code is not considered to be an *alteration* and does not require a construction permit.~~

[A] 105.6.4 Emergency responder communication coverage system. A construction permit is required for installation of or modification to in-building, two-way emergency responder communication coverage systems and related equipment. ~~Maintenance performed in accordance with this code is not considered to be a modification and does not require a construction permit.~~

105.6.5 Energy storage systems. A construction permit is required to install energy storage systems regulated by Section 1207.

[A] 105.6.6 Fire alarm and detection systems and related equipment. A construction permit is required for installation of or modification to fire alarm and detection systems and related equipment. ~~Maintenance performed in accordance with this code is not considered to be a modification and does not require a construction permit.~~

[A] 105.6.7 Fire pumps and related equipment. A construction permit is required for installation of or modification to fire pumps and related fuel tanks, jockey pumps, controllers and generators. ~~Maintenance performed in accordance with this code is not considered to be a modification and does not require a construction permit.~~

[A] 105.6.8 Flammable and combustible liquids. A construction permit is required:

1. To install, repair or modify a pipeline for the transportation of *flammable* or *combustible liquids*.

2. To install, construct or alter tank vehicles, equipment, tanks, plants, terminals, wells, fuel-dispensing stations, refineries, distilleries and similar facilities where *flammable* and *combustible liquids* are produced, processed, transported, stored, dispensed or used. ~~Maintenance performed in accordance with this code is not considered an installation, construction or alteration and does not require a permit.~~
3. To install, alter, remove, abandon or otherwise dispose of a *flammable* or *combustible liquid tank*.

[A] 105.6.9 Fuel cell power systems. A construction permit is required to install *stationary fuel cell power systems*.

[A] 105.6.10 Gas detection systems. A construction permit is required for the installation of or modification to gas detection systems. ~~Maintenance performed in accordance with this code is not considered a modification and shall not require a permit.~~

[A] 105.6.11 Gates and barricades across fire apparatus access roads. A construction permit is required for the installation of or modification to a gate or barricade across a fire apparatus access road.

[A] 105.6.12 Hazardous materials. A construction permit is required to install, repair damage to, abandon, remove, place temporarily out of service, or close or substantially modify a storage facility or other area regulated by Chapter 50 where the hazardous materials in use or storage exceed the amounts listed in Table 105.5.22.

~~**Exceptions:**~~

~~1. Routine maintenance.~~

~~2. For repair work performed on an emergency basis, application for permit shall be made within two working days of commencement of work.~~

[A] 105.6.13 High-piled combustible storage. A construction permit is required for the installation of or modification to a structure with more than 500 square feet (46 m^2), including aisles, of *high-piled combustible storage*. ~~Maintenance performed in accordance with this code is not considered to be a modification and does not require a construction permit.~~

[A] 105.6.14 Industrial ovens. A construction permit is required for installation of industrial ovens regulated by Chapter 30.

~~**Exceptions:**~~

~~1. Routine maintenance.~~

~~2. For repair work performed on an emergency basis, application for permit shall be made within two working days of commencement of work.~~

[A] 105.6.15 LP-gas. A construction permit ~~is required~~ for installation of or modification to an LP-gas system may be required and approved by the North Carolina Department of Agriculture and Consumer Services. ~~Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.~~

[A] 105.6.16 Motor vehicle repair rooms and booths. A construction permit is required to install or modify a motor vehicle repair room or booth. ~~Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.~~

[A] 105.6.17 Plant extraction systems. A construction permit is required for installation of or modification to plant extraction systems. ~~Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.~~

[A] 105.6.18 Private fire hydrants. A construction permit is required for the installation or modification of private fire hydrants. ~~Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.~~

[A] 105.6.19 Smoke control or smoke exhaust systems. Construction permits are required for installation of or alteration to smoke control or smoke exhaust systems. ~~Maintenance performed in accordance with this code is not considered to be an alteration and does not require a permit.~~

[A] 105.6.20 Solar photovoltaic power systems. A construction permit is required to install or modify solar photovoltaic power systems. ~~Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.~~

[A] 105.6.21 Special event structure. A single construction permit is required to erect and take down a *temporary special event structure*.

[A] 105.6.22 Spraying or dipping. A construction permit is required to install or modify a spray room, dip tank or booth. ~~Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.~~

[A] 105.6.23 Standpipe systems. A construction permit is required for the installation, modification or removal from service of a standpipe system. ~~Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.~~

[A] 105.6.24 Temporary membrane structures and tents. A construction permit is required to erect a~~n air-supported~~ temporary *membrane structure*~~,~~ ~~or a temporary stage canopy~~ having an area in excess of 400 square feet (37 m^2)~~,~~ or a *tent* having an area in excess of ~~400~~ 800 square feet (~~37~~ 74 m^2).

Exceptions:

1. *Tents* used exclusively for recreational camping purposes.
2. Funeral *tents* and curtains, or extensions attached thereto, when used for funeral services.
3. *Tents* and awnings open on all sides, which comply with all of the following:
   - 3.1. Individual *tents* having a maximum size of ~~700 square feet (65 m^2)~~ 1,800 square feet (167 m^2)
   - 3.2. The aggregate area of multiple *tents* placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed ~~700 square feet (65 m^2)~~ 1,800 square feet (167 m^2)total.
   - 3.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be maintained.

SECTION 106
CONSTRUCTION DOCUMENTS

[A] 106.2.4.1 Phased approval. The *fire code official* is authorized to issue a permit for the construction of part of a structure, system or operation before the *construction documents* for the whole structure, system or operation have been submitted, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such permit for parts of a structure, system or operation shall proceed at the holder's own risk with the building operation and without assurance that a permit for the entire structure, system or operation will be granted. Phased approval permits shall include the start and end dates of such approval including submittal of construction documents for the whole structure.

SECTION 107
FEES

Delete

~~**[A] 107.1 Fees.** A permit shall not be issued until the fees have been paid, nor shall an amendment to a permit be released until the additional fee, if any, has been paid.~~

~~**[A] 107.2 Schedule of permit fees.** Where a permit is required, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.~~

~~**107.3 Permit valuations.** The applicant for a permit shall provide an estimated permit value at the time of application. Permit valuations shall include the total value of work, including materials and labor, for which the permit is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. If, in the opinion of the *fire code official*, the valuation is underestimated on the application, the permit shall be denied unless the applicant can show detailed estimates to meet the approval of the *fire code official*. Final permit valuation shall be set by the *fire code official*.~~

~~**[A] 107.4 Work commencing before permit issuance.** A person who commences any work, activity or operation regulated by this code before obtaining the necessary permits shall be subject to a fee established by the applicable governing authority, which shall be in addition to the required permit fees.~~

~~**[A] 107.5 Related fees.** The payment of the fee for the construction, *alteration*, removal or demolition of work done in connection to or concurrently with the work or activity authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.~~

~~**[A] 107.6 Refunds.** The applicable governing authority is authorized to establish a refund policy.~~

SECTION 108
INSPECTIONS

[A] 108.2.1 Periodic inspection schedule. In order to preserve and protect public health and safety and to satisfy the requirements of N.C.G.S. 160D-1117, political subdivisions assuming inspection duties, as set out in N.C.G.S. 160D-1102, shall have a periodic inspection schedule for the purpose of identifying activities and conditions in buildings, structures and premises that pose dangers of fire, explosion or related hazards. This inspection schedule shall be approved by the local governing body and shall be submitted to the Office of State Fire Marshal of the Department of Insurance. In no case shall inspections be conducted less frequently than described in the schedule below:

Once every year: Hazardous, institutional, high-rise, assembly except those noted below, Residential except one- and two-family dwellings, and only the interior common areas of dwelling units of multifamily occupancies. New and existing lodging establishments, including hotels, motels, and tourist homes that provide accommodations for seven or more continuous days (extended-stay establishments), bed and breakfast inns, and bed and breakfast homes as defined in N.C.G.S. 130A-247 for the installation and maintenance of carbon monoxide alarms and detectors in accordance with N.C.G.S. 143-138(b2).

Once every two years: Industrial and educational (except public schools).

Once every three years: Assembly occupancies with an occupant load less than 100, business, mercantile, storage, churches, synagogues, and miscellaneous Group U occupancies.

Frequency rates for inspections of occupancies as mandated by any other applicable North Carolina laws shall supersede the schedule in this section. Nothing in this section is intended to prevent a jurisdiction from conducting more frequent inspections than the schedule listed above, or the schedule filed with the Office of State Fire Marshal of the Department of Insurance.

For unattended or vacant structures, the fire code official shall affix an order of notice on the premises in a conspicuous place at or near the entrance to such premises requesting an inspection in accordance with this section. This order of notice shall be mailed by registered or certified mail with return receipt requested, to the last known address of the owner, occupant or both. If the owner, occupant or both shall fail to respond to the order of notice within 10 calendar days, these actions by the fire code official shall be deemed to constitute an inspection in accordance with this section.

[A] 108.2.~~1~~2 Inspection requests. It shall be the duty of the holder of the permit or their duly authorized agent to notify the *fire code official* when work is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

[A] 108.2.~~2~~3 Approval required. Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the *fire code official*. The *fire code official*, on notification, shall make the requested inspections and shall either indicate the portion of the construction that is satisfactory as completed, or notify the permit holder or his or her agent wherein the same fails to comply with this code. Any portions that do not comply shall be corrected, and such portion shall not be covered or concealed until authorized by the *fire code official*.

SECTION 111
MEANS OF APPEALS

See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

~~**[A] 111.1 Board of appeals established.** In order to hear and decide appeals of orders, decisions or determinations made by the *fire code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *fire code official*.~~

~~**[A] 111.2 Limitations on authority.** An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code or interpret the administration of this code.~~

~~**[A] 111.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to hazards of fire, explosions, hazardous conditions or *fire protection systems*, and are not employees of the jurisdiction.~~

~~**[A] 111.4 Administration.** The *fire code official* shall take immediate action in accordance with the decision of the board.~~

SECTION 112
VIOLATIONS

For violations of the North Carolina Fire Code or a local fire prevention code that have received prior approval of the Building Code Council, either the local fire code official or the State Commissioner of Insurance or other State Official with responsibility under N.C.G.S. 143-139 may, in addition to other remedies, institute any appropriate action or proceedings, including civil remedies set out in N.C.G.S. 160A-175 or N.C.G.S. 153A-123, that have been adopted as ordinances within that jurisdiction.

~~**[A] 112.4 Violation penalties.** Persons who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter, repair or do work in violation of the *approved construction documents* or directive of the *fire code official*, or of a permit or certificate used under provisions of this code, shall be guilty of a **[SPECIFY OFFENSE]**, punishable by a fine of not more than **[AMOUNT]** dollars or by imprisonment not exceeding **[NUMBER OF DAYS]**, or both such fine and imprisonment. Each day that a violation continues after due notice has been served shall be deemed a separate offense.~~

~~**[A] 112.4.1 Abatement of violation.** In addition to the imposition of the penalties herein described, the *fire code official* is authorized to institute appropriate action to prevent unlawful construction or to restrain, correct or abate a violation; or to prevent illegal occupancy of a structure or premises; or to stop an illegal act, conduct of business or occupancy of a structure on or about any premises.~~

SECTION 113
STOP WORK ORDER

See the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

~~**[A] 113.1 Authority.** Where the *fire code official* finds any work regulated by this code being performed in a manner contrary to the provisions of this code, or in a dangerous or unsafe manner, the *fire code official* is authorized to issue a stop work order.~~

~~**[A] 113.2 Issuance.** The stop work order shall be in writing and shall be given to the *owner* of the property, the *owner's* authorized agent or the person performing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work is authorized to resume.~~

~~**[A] 113.3 Emergencies.** Where an emergency exists, the *fire code official* shall not be required to give a written notice prior to stopping the work.~~

~~**[A] 113.4 Failure to comply.** Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fines established by the authority having jurisdiction.~~

SECTION ~~114~~ 115
MAINTAINING A FIRE HAZARD

115.1 Fire hazard. No person shall knowingly maintain a *fire hazard*.

SECTION ~~115~~ 116
LOCAL MODIFICATION

116.1 Local modifications. For local modification see the provisions of the North Carolina Administrative Code and Policies and applicable North Carolina General Statutes.

116.2 Local government modification approved by the Building Code Council. A list of jurisdictions shall be maintained by the North Carolina Department of Insurance, Office of State Fire Marshal.

CHAPTER 2
DEFINITIONS

~~**User note:**~~

~~***About this chapter:** Codes, by their very nature, are technical documents. Every word, term and punctuation mark can add to or change the meaning of a technical requirement. It is necessary to maintain a consensus on the specific meaning of each term contained in the code. Chapter 2 performs this function by stating clearly what specific terms mean for the purpose of the code.~~

SECTION 202
GENERAL DEFINITIONS

ACCEPTED ENGINEERING PRACTICE. Design analysis and testing methods that are used in developing design solutions for compliance with the requirements of this code. Accepted engineering practice is the level at which the average, prudent designer in a given community would practice.

AMBULATORY. Able to respond and evacuate without any physical assistance or verbal prompting during emergency conditions.

[A] APPROVED. Acceptable to the *fire code official* for compliance with the provisions of the applicable code or referenced standard.

BED AND BREAKFAST HOME. A detached single-family dwelling occupied by the dwelling owner and containing eight or fewer guest rooms for rent for a period of less than one week.

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

CIRCULATION PATH. An exterior or interior way of passage from one place to another for pedestrians.

Class II. Liquids having a closed cup *flash point* at or above 100°F (38°C) and below 140°F (60°C).

Class IIIA. Liquids having a closed cup *flash point* at or above 140°F (60°C) and below 200°F (93°C).

Class IIIB. Liquids having closed cup *flash points* at or above 200°F (93°C).

COMMERCIAL MOTOR VEHICLE. A motor vehicle used to transport passengers or property where the motor vehicle:

1. Has a gross vehicle weight rating of 26,001 ~~10,000~~ pounds (11,794 kg) ~~(454 kg)~~ or more; or
2. Is designed to transport 16 or more passengers, including the driver.

COOPERATIVE INNOVATIVE HIGH SCHOOL PROGRAM. A program to supplement the required curriculum for high school students that may require attendance at a college, community college or university.

DISPLAY OPERATOR. An individual who exhibits, uses, handles, manufactures, or discharges pyrotechnics at a concert or public exhibition in this State and possesses a Display Operator's License issued by the Office of State Fire Marshal.

DISPLAY OPERATOR'S LICENSE. A license issued by the Office of State Fire Marshal to an individual in accordance with North Carolina General Statutes, Chapter 58, Article 82A.

ELECTRICAL CIRCUIT PROTECTIVE SYSTEM. A specific construction of devices, materials, or coatings installed as a fire-resistive barrier system applied to electrical system components.

FARM BUILDING. Any building not used for sleeping purposes that is not accessed by the general public and is used primarily for a farm purpose. Farm purposes include structures or buildings for equipment, storage and processing of agricultural products or commodities such as: crops, fruits, vegetables, ornamental or flowering plants, dairy, timber, livestock, poultry and all other such forms of agricultural products by the specific farm on which the structure or building is located. Farm purposes do not include structures or buildings for uses such as education facilities, research facilities, or aircraft hangers.

FIRE FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for firefighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m^2), used to determine the required fire flow.

FIRE HAZARD. Any thing or act that increases or may cause an increase of the hazard or menace of fire to a greater degree than that customarily recognized as normal by persons in the public service regularly engaged in preventing, suppressing or extinguishing fire, or that may obstruct, delay, hinder or interfere with the operations of the fire department or the egress of occupants in the event of fire.

FIREWORKS. Any composition or device for the purpose of producing a visible or an audible effect for entertainment purposes by combustion, *deflagration* or *detonation* that meets the definition of 1.3G fireworks or 1.4G fireworks.

Fireworks, 1.3G. Large fireworks devices, which are *explosive materials*, intended for use in fireworks displays and designed to produce audible or visible effects by combustion, *deflagration* or *detonation*. Such 1.3G fireworks include, but are not limited to, firecrackers containing more than 130 milligrams (2 grains) of explosive composition, aerial shells containing more than 40 grams of pyrotechnic composition and other display pieces which exceed the limits for classification as 1.4G fireworks. Such 1.3G fireworks are also described as Fireworks, UN 0335 by the DOTn.

Fireworks, 1.4G. North Carolina General Statute 14- 414. The following fireworks are allowed to be sold, used or possessed without a permit:

1. Explosive caps designed to be fired in toy pistols, provided that the explosive mixture of the explosive caps shall not exceed twenty-five hundredths (0.25) of a gram for each cap;
2. Snake and glow worms composed of pressed pellets of a pyrotechnic mixture that produces a large, snake-like ash when burning;
3. Smoke devices consisting of a tube or sphere containing a pyrotechnic mixture that produces white or colored smoke;
4. Trick noisemakers that produce a small report designed to surprise the user that include:
   - 4.1. A party popper, that is a small plastic or paper item containing not in excess of 16 milligrams of explosive mixture. A string protruding from the device is pulled to ignite the device, expelling paper streamers and producing a small report.
   - 4.2. A string popper, that is a small tube containing not in excess of 16 milligrams of explosive mixture with a string protruding from both ends. The strings are pulled to ignite the friction-sensitive mixture, producing a small report.
   - 4.3. A snapper, or drop pop, that is a small paper-wrapped item containing no more than 16 milligrams of explosive mixture coated on small bits of sand. When dropped, the device produces a small report.
5. Wire sparklers consisting of wire or stick coated with nonexplosive mixture that produces a shower of sparks upon ignition. These items must not exceed 100 grams of mixture per item;

6. Other sparkling devices that emit showers of sparks and sometimes a whistling or crackling effect when burning, do not detonate or explode, do not spin, are hand-held or ground-based, cannot propel themselves through the air and contain not more than 75 grams of chemical compound per tube or not more than 200 grams of chemical compound if multiple tubes are used.

[BE] FIXED SEATING. Furniture or fixtures designed and installed for the use of sitting and permanently secured in place including bench-type seats and seats with or without back or arm rests.

[BG] GREENHOUSE. A structure or thermally isolated area of a building that maintains a specialized sunlit environment used for and essential to the cultivation, protection or maintenance of plants.

[BS] GYPSUM BOARD. The generic name for a family of sheet products consisting of a noncombustible core primarily of gypsum with paper surfacing. Gypsum wallboard, gypsum sheathing, gypsum base for gypsum veneer plaster, exterior gypsum soffit board, predecorated gypsum board or water-resistant gypsum backing board complying with the standards listed in Tables 2506.2 and 2507.2 and Chapter 35 of the *International Building Code*.

KEY BOX. A secure device with a lock operable only by a fire department master key, and containing building entry keys and other keys that may be required for access in an emergency.

[A] LABELED. Appliances, equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, *approved* agency or other organization concerned with product evaluation that maintains periodic inspection of the production of such labeled items and whose labeling indicates either that the appliances, equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose. (Laboratories, agencies or organizations that have been identified by approval and accreditation bodies, such as ANSI, IAS, ICC or OSHA, are acceptable.)

LADDER. As described by OSHA Standard 29 CFR 1910 – General Industry, Part 1910.23—Fixed Ladders.

LICENSING AGENCY. A North Carolina State licensing or certification agency that has regulatory authority to create and enforce rules and regulations for a facility or building.

[A] LISTED. Appliances, equipment, materials, products or services included in a list published by an organization acceptable to the *fire code official* and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the appliances, equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

[BG] LODGING HOUSE. A one-family *dwelling* where one or more occupants are primarily permanent in nature and rent is paid for guest rooms~~. See "Bed-and-breakfast home."~~

NIGHTCLUB. An A-2 occupancy meeting all of the following conditions:

1. The aggregate floor area of concentrated use and standing space that is used for dancing or viewing of performers exceeds 10 percent of the Group A-2 fire area, excluding adjacent lobby areas; and

2. Provides live or recorded entertainment by performing artist; and

3. Allows alcoholic beverages consumption.

[BG] NURSING HOMES. Facilities that provide care on a 24-hour basis, including both intermediate care facilities and skilled nursing facilities, where any of the persons are incapable of self-preservation.

OCCUPANCY CLASSIFICATION. ~~For the purposes of this code, certain occupancies are defined as follows:~~ **See Section 203**

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

~~**[BG] Accessory with places of religious worship.** Accessory religious educational rooms and religious auditoriums with *occupant loads* of less than 100 per room or space are not considered separate occupancies.~~

[BG] Assembly Group A 1. Group A occupancy includes assembly uses, usually with fixed seating, intended for the production and viewing of performing arts or motion pictures including, but not limited to:

Motion picture theaters

Symphony and concert halls

Television and radio studios admitting an audience

Theaters

[BG] Assembly Group A 2. Group A 2 occupancy includes assembly uses intended for food and/or drink consumption including, but not limited to:

Banquet halls

Casinos (gaming areas)

Night clubs

Restaurants, cafeterias and similar dining facilities (including associated commercial kitchens)

Taverns and bars

[BG] Assembly Group A 3. Group A 3 occupancy includes assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A, including, but not limited to:

Amusement arcades

Art galleries

Bowling alleys

Community halls

Courtrooms

Dance halls (not including food or drink consumption)

Exhibition halls

Funeral parlors

Greenhouses with public access for the conservation and exhibition of plants

Gymnasiums (without spectator seating)

Indoor swimming pools (without spectator seating)

Indoor tennis courts (without spectator seating)

Lecture halls

Libraries

Museums

Places of religious worship

Pool and billiard parlors

Waiting areas in transportation terminals

[BG] Assembly Group A 4. Group A 4 occupancy includes assembly uses intended for viewing of indoor sporting events and activities with spectator seating including, but not limited to:

Arenas

Skating rinks

Swimming pools

Tennis courts

[BG] Assembly Group A-5. Group A-5 occupancy includes assembly uses intended for participation in or viewing outdoor activities including, but not limited to:

Amusement park structures

Bleachers

Grandstands

Stadiums

[BG] Associated with Group E occupancies. A room or space used for assembly purposes that is associated with a Group E occupancy is not considered a separate occupancy.

[BG] Small assembly spaces. The following rooms and spaces shall not be classified as assembly occupancies:

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

[BG] Small buildings and tenant spaces. A building or tenant space used for assembly purposes with an *occupant load* of less than 50 persons shall be classified as a Group B occupancy.

[BG] Special amusement areas. Special amusement areas shall comply with Section 411 of the *International Building Code*.

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

Airport traffic control towers

Ambulatory care facilities

Animal hospitals, kennels and pounds

Banks

Barber and beauty shops

Car wash

Civic administration

Clinic-outpatient

Dry cleaning and laundries: pick-up and delivery stations and self-service

Educational occupancies for students above the 12th grade, including higher education laboratories

Electronic data processing

Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities not more than 2,500 square feet (232 m^2) in area.

Laboratories: testing and research

Motor vehicle showrooms

Post offices

Print shops

Professional services (architects, attorneys, dentists, physicians, engineers, etc.)

Radio and television stations

Telephone exchanges

Training and skill development not in a school or academic program (This shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics and similar uses regardless of the ages served, and where not classified as a Group A occupancy).

[BG] Airport traffic control towers. Airport traffic control towers shall comply with Section 412.2 of the *International Building Code*.

[BG] Ambulatory care facilities. Ambulatory care facilities shall comply with Section 422 of the *International Building Code*.

[BG] Higher education laboratories. Higher education laboratories shall comply with Section 428 of the *International Building Code*.

[BG] Group E, Educational. Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade.

[BG] Accessory to places of religious worship. Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with Section 303.1.4 of the *International Building Code* and have *occupant loads* of less than 100 per room or space shall be classified as Group A-3 occupancies.

[BG] Group E, day care facilities. This group includes buildings and structures or portions thereof occupied by more than five children older than 2½ years of age who receive educational, supervision or *personal care services* for less than 24 hours per day.

[BG] Five or fewer children. A facility having five or fewer children receiving such care shall be classified as part of the primary occupancy.

[BG] Five or fewer children in a dwelling unit. A facility such as the above within a *dwelling unit* and having five or fewer children receiving such care shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code*.

[BG] Within places of worship. Rooms and spaces within places of worship providing such care during religious functions shall be classified as part of the primary occupancy.

[BG] Storm shelters in Group E occupancies. Storm shelters shall be provided for Group E occupancies where required by Section 423.4 of the *International Building Code*.

[BG] Group F, Factory Industrial. Factory Industrial Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H high-hazard or Group S storage occupancy.

[BG] Factory Industrial F-1 Moderate-hazard occupancy. Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

Aircraft (manufacturing, not to include repair)

Appliances

Athletic equipment

Automobiles and other motor vehicles

Bakeries

Beverages; over 16-percent alcohol content

Bicycles

Boats

Brooms or brushes

Business machines

~~Cameras and photo equipment~~

~~Canvas or similar fabric~~

~~Carpets and rugs (includes cleaning)~~

~~Clothing~~

~~Construction and agricultural machinery~~

~~Disinfectants~~

~~Dry cleaning and dyeing~~

~~Electric generation plants~~

~~Electronics~~

~~Energy storage systems (ESS) in dedicated-use buildings~~

~~Engines (including rebuilding)~~

~~Food processing and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m^2) in area.~~

~~Furniture~~

~~Hemp products~~

~~Jute products~~

~~Laundries~~

~~Leather products~~

~~Machinery~~

~~Metals~~

~~Millwork (sash and door)~~

~~Motion pictures and television filming (without spectators)~~

~~Musical instruments~~

~~Optical goods~~

~~Paper mills or products~~

~~Photographic film~~

~~Plastic products~~

~~Printing or publishing~~

~~Refuse incineration~~

~~Shoes~~

~~Soaps and detergents~~

~~Textiles~~

~~Tobacco~~

~~Trailers~~

~~Upholstering~~

~~Water/sewer treatment facilities~~

~~Wood; distillation~~

~~Woodworking (cabinet)~~

[BG] Aircraft manufacturing facilities. Aircraft manufacturing facilities shall comply with Section 412.6 of the *International Building Code*.

[BG] Factory Industrial F-2 Low-hazard Occupancy. Factory industrial uses involving the fabrication or manufacturing of noncombustible materials that, during finishing, packaging or processing do not involve a significant fire hazard, shall be classified as Group F-2 occupancies and shall include, but not be limited to, the following:

Beverages; up to and including 16 percent alcohol content

Brick and masonry

Ceramic products

Foundries

Glass products

Gypsum

Ice

Metal products (fabrication and assembly)

Group H, High-hazard. High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or *health hazard* in quantities in excess of those allowed in *control areas* complying with Section 5003.8.3, based on the maximum allowable quantity limits for *control areas* set forth in Tables 5003.1.1(1) and 5003.1.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this code and the requirements of Section 415 of the *International Building Code*. Hazardous materials stored or used on top of roofs or canopies shall be classified as outdoor storage or use and shall comply with this code.

High-hazard Group H-1. Buildings and structures containing materials that pose a *detonation* hazard shall be classified as Group H-1. Such materials shall include, but not be limited to, the following:

Detonable pyrophoric materials

Explosives:

Division 1.1

Division 1.2

Division 1.3

Division 1.4

Division 1.5

Division 1.6

Organic peroxides, unclassified detonable

Oxidizers, Class 4

Unstable (reactive) materials, Class 3 detonable, and Class 4

High-hazard Group H-2. Buildings and structures containing materials that pose a *deflagration* hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or *combustible liquids* that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)

Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3 of the *International Building Code*

Cryogenic fluids, flammable

Flammable gases

Organic peroxides, Class I

Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)

Pyrophoric liquids, solids and gases, nondetonable

Unstable (reactive) materials, Class 3, nondetonable

Water-reactive materials, Class 3

High-hazard Group H-3. Buildings and structures containing materials that readily support combustion or that pose a *physical hazard* shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or *combustible liquids* that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less

Combustible fibers, other than densely packed baled cotton, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3 of the *International Building Code*

Consumer fireworks, 1.4G (Class C, Common)

Cryogenic fluids, oxidizing

Flammable solids

Organic peroxides, Class II and III

Oxidizers, Class 2

Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less

Oxidizing gases

Unstable (reactive) materials, Class 2

Water-reactive materials, Class 2

High-hazard Group H-4. Buildings and structures containing materials that are *health hazards* shall be classified as Group H-4. Such materials shall include, but not be limited to, the following:

Corrosives

Highly toxic materials

Toxic materials

High-hazard Group H-5. Semiconductor fabrication facilities and comparable research and development areas in which hazardous production materials (HPM) are used and the aggregate quantity of materials is in excess of those listed in Tables 5003.1.1(1) and 5003.1.1(2) shall be classified as Group H-5. Such facilities and areas shall be designed and constructed in accordance with Section 415.11 of the *International Building Code*.

Multiple hazards. Buildings and structures containing a material or materials representing hazards that are classified in one or more of Groups H-1, H-2, H-3 and H-4 shall conform to the code requirements for each of the occupancies so classified.

Occupancies containing explosives not classified as H-1. The following occupancies containing *explosive materials* shall be classified as follows:

1. Division 1.3 *explosive materials* that are used and maintained in a form where either confinement or configuration will not elevate the hazard from a mass fire hazard to mass explosion hazard shall be allowed in Group H-2 occupancies.
2. Articles, including articles packaged for shipment, that are not regulated as a Division 1.4 explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a *detonation* or deflagration between articles shall be allowed in H-3 occupancies.

Uses other than Group H. The storage, use or handling of hazardous materials as described in one or more of the following items shall not cause the occupancy to be classified as Group H, but it shall be classified as the occupancy that it most nearly resembles:

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Chapter 24 of this code and Section 416 of the *International Building Code*.
2. Wholesale and retail sales and storage of *flammable* and *combustible liquids* in mercantile occupancies conforming to Chapter 57.
3. Closed piping system containing *flammable* or *combustible liquids* or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize *combustible liquid* solvents having a *flash point* of 140°F (60°C) or higher in *closed systems* employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1 hour *fire barriers* in accordance with Section 707 of the *International Building Code* or 1-hour *horizontal assemblies* in accordance with Section 711 of the *International Building Code*, or both.
5. Cleaning establishments that utilize a liquid solvent having a *flash point* at or above 200°F (93°C).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary storage battery systems installed in accordance with Section 1207.
10. *Corrosive* personal or household products in their original packaging used in retail display.
11. Commonly used *corrosive* building materials.
12. Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1, provided that such buildings conform to the requirements of Chapter 51.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the *maximum allowable quantity per control area* in Group M or S occupancies complying with Section 5003.8.3.5.1.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided that such storage conforms to the quantity limits and requirements of this code.
15. Stationary fuel cell power systems installed in accordance with this code.
16. *Capacitor energy storage systems* in accordance with this code.
17. Group B higher education laboratory occupancies complying with Section 428 of the *International Building Code* and Chapter 38 of this code.
18. Distilling or brewing of beverages conforming to the requirements of this code.
19. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of this code.

[BG] Group I, Institutional. Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which care or supervision is provided to persons who are or are not capable of self-preservation without physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

[BG] Institutional Group I-1. Institutional Group I-1 occupancy shall include buildings, structures or portions thereof for more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised environment and receive custodial care. Buildings of Group I-1 shall be classified as one of the occupancy conditions indicated below and shall comply with Section 420 of the *International Building Code*. This group shall include, but not be limited to, the following:

Alcohol and drug centers

Assisted living facilities

Congregate care facilities

Group homes

Halfway houses

Residential board and care facilities

Residential board and custodial care facilities

Social rehabilitation facilities

[BG] Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care who, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

[BG] Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

[BG] Five or fewer persons receiving custodial care. A facility with five or fewer persons receiving custodial care shall be classified as Group R-3 or shall comply with the *International Residential Code* provided that an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.

[BG] Six to 16 persons receiving custodial care. A facility housing not fewer than six and not more than 16 persons receiving custodial care shall be classified as Group R-4.

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

Foster care facilities

Detoxification facilities

Hospitals

Nursing homes

Psychiatric hospitals

[BG] Occupancy Conditions. Buildings of Group I-2 shall be classified as one of the following occupancy conditions and shall comply with Section 407 of the International Building Code:

[BG] Condition 1. This occupancy condition shall include facilities that provide nursing and medical care but do not provide emergency care, surgery, obstetrics, or in-patient stabilization units for psychiatric or detoxification, including, but not limited to, nursing homes and foster care facilities.

[BG] Condition 2. This occupancy condition shall include facilities that provide nursing and medical care and could provide emergency care, surgery, obstetrics, or inpatient stabilization units for psychiatric or detoxification, including, but not limited to, hospitals.

[BG] Five or fewer persons receiving medical care. A facility with five or fewer persons receiving medical care shall be classified as Group R-3 or shall comply with the *International Residential Code* provided that an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.

[BG] Institutional Group I-3. Institutional Group I-3 occupancy shall include buildings and structures which are inhabited by more than five persons who are under restraint or security. A Group I-3 facility is occupied by persons who are generally incapable of self-preservation due to security measures not under the occupants' control. This group shall include, but not be limited to, the following:

Correctional centers

Detention centers

Jails

Prerelease centers

Prisons

Reformatories

Buildings of Group I-3 shall be classified as one of the following occupancy conditions and shall comply with Section 408 of the *International Building Code*:

[BG] Condition 1. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and other spaces where access or occupancy is permitted to the exterior via *means of egress* without restraint. A Condition 1 facility is permitted to be constructed as Group R.

[BG] Condition 2. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and any other occupied *smoke compartment* to one or more other *smoke compartments*. Egress to the exterior is impeded by locked *exits*.

[BG] Condition 3. This occupancy condition shall include buildings in which free movement is allowed within individual *smoke compartments*, such as within a residential unit comprised of individual *sleeping units* and group activity spaces, where egress is impeded by remote-controlled release of *means of egress* from such *smoke compartment* to another *smoke compartment*.

[BG] Condition 4. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Remote-controlled release is provided to permit movement from *sleeping units*, activity spaces and other occupied areas within the *smoke compartment* to other *smoke compartments*.

[BG] Condition 5. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Staff-controlled manual release is provided to permit movement from *sleeping units*, activity spaces and other occupied areas within the *smoke compartment* to other *smoke compartments*.

[BG] Institutional Group I-4, day care facilities. Institutional Group I-4 shall include buildings and structures occupied by more than five persons of any age who receive custodial care for less than 24 hours by persons other than parents or guardians; relatives 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

[BG] Classification as Group E. A child day care facility that provides care for more than five but not more than 100 children 2½ 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.

[BG] Five or fewer occupants receiving care in a dwelling unit. A facility such as the above within a *dwelling unit* and having five or fewer persons receiving custodial care shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code*.

[BG] Five or fewer occupants receiving care. A facility having five or fewer persons receiving custodial care shall be classified as part of the primary occupancy.

[BG] Within a place of religious worship. Rooms and spaces within places of religious worship providing such care during religious functions shall be classified as part of the primary occupancy.

[BG] Group M, Mercantile. Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof, for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public. Mercantile occupancies shall include, but not be limited to, the following:

Department stores

Drug stores

Greenhouses with public access that maintain plants for display and sale

Markets

Motor fuel-dispensing facilities

Retail or wholesale stores

Sales rooms

[BG] Motor fuel-dispensing facilities. Motor fuel-dispensing facilities shall comply with Section 406.7 of the *International Building Code*.

[BG] Quantity of hazardous materials. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored or displayed in a single control area of a Group M occupancy shall not exceed the quantities in Table 5704.3.4.1.

[BG] Group R, Residential. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2 of the *International Building Code*. Group R occupancies not constructed in accordance with the International Residential Code as permitted by Sections 310.4.1 and 310.4.2 of the *International Building Code* shall comply with Section 420 of the *International Building Code*.

[BG] Residential Group R-1. Residential Group R-1 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)

[BG] Residential Group R-2. Residential Group R-2 occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

Apartment houses

Congregate living facilities (nontransient) with more than 16 occupants

Boarding houses (nontransient)

Convents

Dormitories

Fraternities and sororities

Monasteries

Hotels (nontransient)

Live/work units

Motels (nontransient)

Vacation timeshare properties

[BG] Residential Group R-3. Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

Buildings that do not contain more than two *dwelling units*

Care facilities that provide accommodations for five or fewer persons receiving care

Congregate living facilities (nontransient) with 16 or fewer occupants

Boarding houses (nontransient)

Convents

Dormitories

Fraternities and sororities

Monasteries

Congregate living facilities (transient) with 10 or fewer occupants

Boarding houses (transient)

Lodging houses (transient) with five or fewer *guest rooms* and 10 or fewer occupants

[BG] Care facilities within a dwelling. Care facilities for five 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 or Section P2904 of the *International Residential Code*.

[BG] Lodging houses. Owner-occupied *lodging houses* with five or fewer guestrooms and 10 or fewer total occupants shall be permitted to be constructed in accordance with the *International Residential Code* provided that an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

[BG] Residential Group R-4. Residential Group R-4 shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive custodial care. Buildings of Group R-4 shall be classified as one of the occupancy conditions indicated below. This group shall include, but not be limited to, the following:

Alcohol and drug centers

Assisted living facilities

Congregate care facilities

Group homes

Halfway houses

Residential board and care facilities

Social rehabilitation facilities

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in the *International Building Code*.

[BG] Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

[BG] Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

[BG] Group S, Storage. Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy.

[BG] Group S-1 moderate-hazard storage. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

Aerosols, Levels 2 and 3

Aircraft hangar (storage and repair)

Bags: cloth, burlap and paper

Bamboos and rattan

Baskets

Belting: canvas and leather

Beverages over 16-percent alcohol content

Books and paper in rolls or packs

Boots and shoes

Buttons, including cloth covered, pearl or bone

Cardboard and cardboard boxes

Clothing, woolen wearing apparel

Cordage

Dry boat storage (indoor)

Furniture

Furs

Glues, mucilage, pastes and size

Grains

Horns and combs, other than celluloid

Leather

Linoleum

Lumber

Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 5003.1.1(1) (see Section 406.8 of the *International Building Code*)

Photo engravings

Resilient flooring

Self-service storage facility (mini-storage)

Silks

Soaps

Sugar

Tires, bulk storage of Tobacco, cigars, cigarettes and snuff

Upholstery and mattresses

Wax candles

[BG] Aircraft hangars. Aircraft hangars used for storage or repair shall comply with Section 412.3 of the *International Building Code.*

[BG] Motor vehicle repair garages. Motor vehicle repair garages shall comply with Section 406.8 of the *International Building Code.*

[BG] Group S-2 low-hazard storage. Storage Group S-2 occupancies include, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles or film wrapping. Storage uses shall include, but not be limited to, storage of the following:

Asbestos

Beverages up to and including 16-percent alcohol

Cement in bags

Chalk and crayons

Dairy products in nonwaxed coated paper containers

Dry cell batteries

Electrical coils

Electrical motors

Empty cans

Food products

Foods in noncombustible containers

Fresh fruits and vegetables in nonplastic trays or containers

Frozen foods

Glass

Glass bottles, empty or filled with noncombustible liquids

Gypsum board

Inert pigments

Ivory

Meats

Metal cabinets

Metal desks with plastic tops and trim

Metal parts

Metals

Mirrors

Oil-filled and other types of distribution transformers

Porcelain and pottery

Public parking garages, open or enclosed

Stoves

Talc and soapstones

Washers and dryers

[BG] Public parking garages. Public parking garages shall comply with Section 406.4 of the *International Building Code* and the additional requirements of Section 406.5 of the *International Building Code* for open parking garages or Section 406.6 of the *International Building Code* for enclosed parking garages.

[BG] Combustible storage. High-piled stock or rack storage, or attic, under-floor and concealed spaces used for storage of combustible materials, shall be in accordance with Section 413 of the *International Building Code*.

[BG] Accessory storage spaces. A room or space used for storage purposes that is accessory to another occupancy shall be classified as part of that occupancy.

[BG] Group U, Miscellaneous. Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

Agricultural buildings

~~Aircraft hangar, accessory to a one- or two-family residence (see Section 412.4 of the *International Building Code*)~~

~~Barns~~

~~Carports~~

~~Communication equipment structures with a gross floor area of less than 1,500 square feet (139 m^2)~~

~~Fences more than 7 feet (2134 mm) in height~~

~~Grain silos, accessory to a residential occupancy~~

~~Livestock shelters~~

~~Private garages~~

~~Retaining walls~~

~~Sheds~~

~~Stables~~

~~Tanks~~

~~Towers~~

~~**[BG] Private garages and carports.** Private garages and carports shall comply with Section 406.3 of the *International Building Code*.~~

~~**[BG] Residential aircraft hangars.** Aircraft hangars accessory to a one- or two-family residence shall comply with Section 412.4 of the *International Building Code*.~~

~~**[BG] Greenhouses.** Greenhouses not classified as another occupancy shall be classified as Use Group U.~~

OPEN AIR CAMP CABIN. A single-story residential building that has three walls consisting of at least twenty percent (20%) screened openings with a maximum height of 44 inches (1118 mm) above the finished floor to the bottom of the openings, has no heating or cooling system, and is occupied for no more than 150 days within any rolling 365-day time span.

OUTDOOR ASSEMBLY EVENT. ~~An outdoor gathering of persons for any purpose.~~ An outdoor area attended by more than 1000 persons, which includes a theatrical exhibition, fair, festival, display, entertainment, amusement, rally, or similar gatherings, but does not include assemblages held in a manner consistent with the *approved* property or occupancy use.

[B] PRIVATE WATERFRONT STRUCTURES. A dock, pier, bulkhead, or associated structure that does not meet the definition of public waterfront structure.

[B] PUBLIC WATERFRONT STRUCTURES. A dock, pier, bulkhead, or associated structure located on residential property serving more than 10 boat slips, public property or commercial property.

[A] REGISTERED DESIGN PROFESSIONAL. An architect or engineer, registered or licensed to practice professional architecture or engineering, as defined by the statutory requirements of the professional registration laws of the state in which the project is to be constructed. Design by a registered design professional is not required where exempt under the registration or licensure laws.

RESPITE CARE FACILITY. A facility that provides overnight, temporary custodial care to no more than 6 individuals who are elderly, have a physical disability or a mental impairment. The length of stay shall not exceed 14 consecutive calendar days and 60 total days annually per recipient.

[BG] SWIMMING POOL. Any structure intended for swimming, recreational bathing or wading that contains water over 24 inches (610 mm) deep. This includes in-ground, above-ground and on-ground pools; hot tubs; spas and fixed-in-place wading pools.

TEMPORARY OVERFLOW SHELTER. A shelter that provides temporary overflow accommodations from an approved homeless shelter in accordance with Section 322.

[A] TOWNHOUSE. A single-family *dwelling unit* constructed in a group of two ~~three~~ or more attached units separated by property lines or assumed property lines in which each unit extends from ~~the~~ foundation to roof and with yard or public way ~~open space~~ on not less than two sides.

Valet Trash Collection Service. A scheduled trash removal service that collects occupant-generated rubbish, trash, or recyclable materials from dwelling units, where the trash is placed outside of the dwelling units for a limited time and in an approved container.

SECTION 203
OCCUPANCY CLASSIFICATIONS

203.1 Scope. The provisions of the *North Carolina Building Code*, Chapter 3 shall control the classification of all buildings and structures as to use and occupancy.

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

1. Assembly (see Section 203.3): Groups A-1, A-2, A-3, A-4 and A-5.
2. Business (see Section 203.4): Group B.
3. Educational (see Section 203.5): Group E.
4. Factory and Industrial (see Section 203.6): Groups F-1 and F-2.
5. High Hazard (see Section 203.7): Groups H-1, H-2, H-3, H-4 and H-5.
6. Institutional (see Section 203.8): Groups I-1, I-2, I-3 and I-4.
7. Mercantile (see Section 203.9): Group M.
8. Residential (see Section 203.10): Groups R-1, R-2, R-3 and R-4.
9. Storage (see Section 203.11): Groups S-1 and S-2.
10. Utility and Miscellaneous (see Section 203.12): Group U.

ASSEMBLY GROUP A

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

203.3.1 Small buildings and tenant spaces. A building or tenant space used for assembly purposes with an *occupant load* of less than 50 persons shall be classified as a Group B occupancy.

203.3.2 Small assembly spaces. The following rooms and spaces shall not be classified as Assembly occupancies:

1. A room or space used for assembly purposes with an *occupant load* of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

2. A room or space used for assembly purposes that is less than 750 square feet (70 m^2) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

203.3.3 Associated with Group E occupancies. A room or space used for assembly purposes that is associated with a Group E occupancy is not considered a separate occupancy.

203.3.4 Accessory to places of religious worship. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 per room or space are not considered separate occupancies.

203.3.5 Special amusement areas. Special amusement areas shall comply with Section 411 of the *International Building Code*.

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

Motion picture theaters

Symphony and concert halls

Television and radio studios admitting an audience

Theaters

203.3.6 Assembly Group A-2. Group A-2 occupancy includes assembly uses intended for food and/or drink consumption including, but not limited to:

Banquet halls

Casinos (gaming areas)

Nightclubs

Restaurants, cafeterias and similar dining facilities (including associated commercial kitchens)

Taverns and bars

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

Amusement arcades

Art galleries

Bowling alleys

Community halls

Courtrooms

Dance halls (not including food or drink consumption)

Exhibition halls

Funeral parlors

Greenhouses for the conservation and exhibition of plants that provide public access

Gymnasiums (without spectator seating)

Indoor *swimming pools* (without spectator seating)

Indoor tennis courts (without spectator seating)

Lecture halls

Libraries

Museums

Places of religious worship

Pool and billiard parlors

Waiting areas in transportation terminals

203.3.8 Assembly Group A-4. Group A-4 occupancy includes assembly uses intended for viewing of indoor sporting events and activities with spectator seating including, but not limited to:

Arenas

Skating rinks

Swimming pools

Tennis courts

203.3.9 Assembly Group A-5. Group A-5 occupancy includes assembly uses intended for participation in or viewing outdoor activities including, but not limited to:

Amusement park structures

Bleachers

Grandstands

Stadiums

BUSINESS GROUP B

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

Airport traffic control towers
Ambulatory care facilities

Animal hospitals, kennels, and pounds

Banks

Barber and beauty shops

Car wash

Civic administration

Clinic, outpatient

Dry cleaning and laundries: pick-up and delivery stations and self-service

Educational occupancies for high school students participating in *Cooperative Innovative High School Programs* taught at colleges, community colleges or universities.

Educational occupancies for students above the 12th grade including *higher education laboratories*

Electronic data processing

Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities not more than 2,500 square feet (232 m^2) in area.

Laboratories: testing and research

Motor vehicle showrooms, including vehicle service check-in areas

Post offices

Print shops

Professional services (architects, attorneys, dentists, physicians, engineers, etc.)

Radio and television stations

Telephone exchanges

Training and skill development not in a school or academic program (this shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics and similar uses regardless of the ages served, and where not classified as a Group A occupancy).

203.4.1 Airport traffic control towers. Airport traffic control towers shall comply with Section 412.2 of the International Building Code.

203.4.2 Ambulatory care facilities. *Ambulatory care facilities* shall comply with Section 422 of the International Building Code.

203.4.3 Higher education laboratories. *Higher education laboratories* shall comply with Section 428 of the International Building Code.

EDUCATIONAL GROUP E

203.5 Educational Group E. Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade.

203.5.1 Accessory to places of religious worship. Religious educational rooms and religious auditoriums, which are accessory to *places of religious worship* in accordance with Section 303.1.4 of the *International Building Code* and have occupant loads of less than 100 per room or space, shall be classified as Group A-3 occupancies.

203.5.2 Cooperative Innovative High School Programs.
Educational occupancies for high school students participating in Cooperative Innovative High School Programs taught at colleges, community colleges or universities shall be classified as Group B occupancies.

203.5.3 Drop-in/short-term child care. Drop-in/short-term child care facility as defined in N.C.G.S. 110-86(2)(d) & (d1) shall be classified as Group E.

203.5.4 Group E, day care facilities. This group includes buildings and structures or portions thereof occupied by more than five children older than $2\frac{1}{2}$ years of age who receive educational, supervision or personal care services for fewer than 24 hours per day.

203.5.4.1 Within places of religious worship. Rooms and spaces within *places of religious worship* providing such day care during religious functions shall be classified as part of the primary occupancy.

203.5.4.2 Five or fewer children. A facility having five or fewer children receiving such day care shall be classified as part of the primary occupancy.

203.5.4.3 Five or fewer children in a dwelling unit. A facility such as the above within a dwelling unit and having five or fewer children receiving such day care shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code*.

203.5.5 Storm shelters in Group E occupancies. *Storm shelters* shall be provided for Group E occupancies where required by Section 423.5 of the *International Building Code*.

FACTORY GROUP F

203.6 Factory Industrial Group F. Factory Industrial Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H hazardous or Group S storage occupancy.

203.6.1 Moderate-hazard Factory Industrial, Group F-1. Factory Industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

Aircraft (manufacturing, not to include repair)

Appliances

Athletic equipment

Automobiles and other motor vehicles

Bakeries

Beverages: over 16-percent alcohol content

Bicycles
Boats

Brooms or brushes

Business machines

Cameras and photo equipment

Canvas or similar fabric

Carpets and rugs (includes cleaning)

Clothing

Construction and agricultural machinery

Disinfectants

Dry cleaning and dyeing

Electric generation plants

Electronics

Energy storage systems (ESS) in dedicated use buildings

Engines (including rebuilding)

Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m_2) in area.

Furniture

Hemp products

Jute products

Laundries

Leather products

Machinery

Metals

Millwork (sash and door)

Motion pictures and television filming (without spectators)

Musical instruments

Optical goods

Paper mills or products

Photographic film
Plastic products

Printing or publishing

Processing and extraction facilities

Recreational vehicles

Refuse incineration

Shoes

Soaps and detergents

Textiles

Tobacco

Trailers

Upholstering

~~Water/sewer treatment facilities~~

Wood; distillation

Woodworking (cabinet)

203.6.1.1 Aircraft manufacturing facilities. Aircraft manufacturing facilities shall comply with Section 412.6 of the International Building Code.

203.6.2 Low-hazard Factory Industrial, Group F-2. Factory Industrial uses that involve the fabrication or manufacturing of noncombustible materials that during finishing, packing or processing do not involve a significant fire hazard shall be classified as F-2 occupancies and shall include, but not be limited to, the following:

Beverages: up to and including 16-percent alcohol content

Brick and masonry

Ceramic products

Foundries

Glass products

Gypsum

Ice

Metal products (fabrication and assembly)

HIGH-HAZARD GROUP H

[F] 203.7 High-hazard Group H. High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in *control areas* complying with Section 5003.8.3, based on the maximum allowable quantity limits for *control areas* set forth in Tables 5003.1.1(1) and 5003.1.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this code and the requirements of Sections 414 and 415 of the *International Building Code*. Hazardous materials stored or used on top of roofs or canopies shall be classified as outdoor storage or use and shall comply with the *International Fire Code*.

[F] 203.7.1 Uses other than Group H. An occupancy that stores, uses or handles hazardous materials as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of this code and Section 416 of the *International Building Code*.

2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to this code.

3. Closed piping system containing *flammable or combustible liquids* or gases utilized for the operation of machinery or equipment.

4. Cleaning establishments that utilize *combustible liquid* solvents having a *flash point* of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 of the

International Building Code or 1-hour *horizontal assemblies* constructed in accordance with Section 711 of the *International Building Code*, or both.

5. Cleaning establishments that utilize a liquid solvent having a *flash point* at or above 200°F (93°C).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary batteries utilized for facility emergency power, uninterruptable power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and *ventilation* is provided in accordance with the *International Mechanical Code*.
10. *Corrosive* personal or household products in their original packaging used in retail display.
11. Commonly used *corrosive* building materials.
12. Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1, provided that such buildings conform to the requirements of Chapter 51.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid *hazardous materials* in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5 of the *International Building Code*.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial *explosive* devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in this code.
15. Stationary fuel cell power systems installed in accordance with this code.
16. *Capacitor energy storage systems* in accordance with this code.
17. Group B higher education laboratory occupancies complying with Section 428 of the *International Building Code* and Chapter 38 of this code.
18. Distilling or brewing of beverages conforming to the requirements of this code.
19. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of this code.

[F] 203.7.2 Hazardous materials. Hazardous materials in any quantity shall conform to the requirements of this code, including Section 414 of the *International Building Code*.

[F] 203.7.3 High-hazard Group H-1. Buildings and structures containing materials that pose a detonation hazard shall be classified as Group H-1. Such materials shall include, but not be limited to, the following:

Detonable *pyrophoric* materials

Explosives:

Division 1.1

Division 1.2

Division 1.3

Division 1.4

Division 1.5

Division 1.6

Organic peroxides, unclassified detonable

Oxidizers, Class 4

Unstable (reactive) materials, Class 3 detonable and Class 4

[F] 203.7.3.1 Occupancies containing explosives not classified as H-1. The following occupancies containing explosive materials shall be classified as follows:

1. Division 1.3 *explosive* materials that are used and maintained in a form where either confinement or configuration will not elevate the hazard from a mass fire to mass *explosion* hazard shall be allowed in Group H-2 occupancies.

2. Articles, including articles packaged for shipment, that are not regulated as a Division 1.4 *explosive* under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles shall be allowed in H-3 occupancies.

[F] 203.7.4 High-hazard Group H-2. Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA *flammable or combustible liquids* that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)

Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3 of the *International Building Code*

Cryogenic fluids, flammable

Flammable gases

Organic peroxides, Class I

Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103 kPa)

Pyrophoric liquids, solids and gases, nondetonable.

Unstable (reactive) materials, Class 3, nondetonable.

Water-reactive materials, Class 3

[F] 203.7.5 High-hazard Group H-3. Buildings and structures containing materials that readily support combustion or that pose a *physical hazard* shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA *flammable or combustible liquids* that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less.

Combustible fibers, other than densely packed baled cotton, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3 of the *International Building Code*.

Consumer *fireworks*, 1.4G (Class C, Common)

Cryogenic fluids, oxidizing

Flammable solids

Organic peroxides, Class II and III

Oxidizers, Class 2

Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less

Oxidizing gases

Unstable (reactive) materials, Class 2

Water-reactive materials, Class 2

[F] 203.7.6 High-hazard Group H-4. Buildings and structures containing materials that are *health hazards* shall be classified as Group H-4. Such materials shall include, but not be limited to, the following:

Corrosives

Highly toxic materials

Toxic materials

[F] 203.7.7 High-hazard Group H-5. Semiconductor fabrication facilities and comparable research and development areas in which hazardous production materials (HPM) are used and the aggregate quantity of materials is in excess of those listed in Tables 5003.1.1(1) and 5003.1.1(2) shall be classified as Group H-5. Such facilities and areas shall be designed and constructed in accordance with Section 415.11 of the *International Building Code*.

[F] 203.7.8 Multiple hazards. Buildings and structures containing a material or materials representing hazards that are classified in one or more of Groups H-1, H-2, H-3 and H-4 shall conform to the code requirements for each of the occupancies so classified.

INSTITUTIONAL GROUP I

203.8 Institutional Group I. Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which care or supervision is provided to persons who are or are not capable of self-preservation without

physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

203.8.1 Institutional Group I-1. Institutional Group I-1 occupancy shall include buildings, structures or portions thereof for more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised environment and receive custodial care. Buildings of Group I-1 shall be classified as one of the occupancy conditions specified in Section 203.8.3.1 or 203.8.3.2 and shall comply with Section 420 of the *International Building Code*. This group shall include, but not be limited to, the following:

Alcohol and drug centers

Assisted living facilities

Congregate care facilities

Group homes

Halfway houses

Residential board and care facilities

Social rehabilitation facilities

203.8.1.1 Condition 1 (Ambulatory)**.** This occupancy condition shall include buildings in which all persons receiving custodial care who, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

203.8.1.2 Condition 2 (Nonambulatory)**.** This occupancy condition shall include buildings in which there are any persons receiving custodial care who require verbal or physical assistance while responding to an emergency situation to complete building evacuation.

203.8.1.3 Six to 16 persons receiving custodial care. A facility housing not fewer than six and not more than 16 persons receiving custodial care shall be classified as Group R-4.

203.8.1.4 Five or fewer persons receiving custodial care. A facility with five or fewer persons receiving custodial 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 or Section P2904 of the *International Residential Code*.

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

Foster care facilities

Detoxification facilities

Hospitals

Nursing homes

Psychiatric hospitals

203.8.2.1 Occupancy conditions. Buildings of Group I-2 shall be classified as one of the occupancy conditions specified in Section 203.8.3.1.1 or 203.8.3.1.2 and shall comply with Section 407 of the *International Building Code*.

203.8.2.1.1 Condition 1 (Ambulatory)**.** This occupancy condition shall include facilities that provide nursing and *medical care* but do not provide emergency care, surgery, obstetrics or in-patient stabilization units for psychiatric or detoxification, including but not limited to ~~*nursing homes* and~~ *foster care facilities*.

203.8.2.1.2 Condition 2 (Nonambulatory)**.** This occupancy condition shall include facilities that provide nursing and *medical care* and could provide emergency care, surgery, obstetrics or in-patient stabilization units for psychiatric or detoxification, including but not limited to *hospitals*, *nursing homes* and licensed assisted living facilities (adult care homes).

203.8.2.2 Five or fewer persons receiving medical care. A facility with five or fewer persons receiving medical 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 or Section P2904 of the *International Residential Code*.

203.8.3 Institutional Group I-3. Institutional Group I-3 occupancy shall include buildings and structures that are inhabited by more than five persons who are under restraint or security. A Group I-3 facility is occupied by persons who are generally *incapable* of *self-preservation* due to security measures not under the occupants' control. This group shall include, but not be limited to, the following:

Correctional centers

Detention centers

Jails

Prerelease centers

Prisons

Reformatories

Buildings of Group I-3 shall be classified as one of the occupancy conditions specified in Sections 203.8.1 through 203.8.5 and shall comply with Section 408 of the *International Building Code*. ~~: (see the *North Carolina Building Code*, Section 408.1).~~

203.8.3.1 Condition 1. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas, and other spaces where access or occupancy is permitted, to the exterior via *means of egress* without restraint. A Condition 1 facility is permitted to be constructed as Group R.

203.8.3.2 Condition 2. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and any other occupied *smoke compartment* to one or more other *smoke compartments*. Egress to the exterior is impeded by locked *exits*.

203.8.3.3 Condition 3. This occupancy condition shall include buildings in which free movement is allowed within individual *smoke compartments*, such as within a residential unit comprised of individual *sleeping units* and group activity spaces, where egress is impeded by remote-controlled release of *means of egress* from such a *smoke compartment* to another *smoke compartment*.

203.8.3.4 Condition 4. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Remote-controlled release is provided to permit movement from *sleeping units*, activity spaces and other occupied areas within the *smoke compartment* to other *smoke compartments*.

203.8.3.5 Condition 5. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Staff-controlled manual release is provided to permit movement from *sleeping units*, activity spaces and other occupied areas within the *smoke compartment* to other *smoke compartments*.

203.8.4 Institutional Group I-4, day care facilities. Institutional Group I-4 occupancy shall include buildings and structures occupied by more than five persons of any age who receive *custodial care* for fewer than 24 hours per day by persons

other than parents or guardians, relatives 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

Respite Care Facility licensed as I-4 day care facilities

203.8.4.1 Classification as Group E. A child day care facility that provides care for more than five but not more than 100 children 2½ 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.

203.8.4.2 Within a place of religious worship. Rooms and spaces within *places of religious worship* providing such care during religious functions shall be classified as part of the primary occupancy.

203.8.4.3 Five or fewer persons receiving care. A facility having five or fewer persons receiving *custodial care* shall be classified as part of the primary occupancy.

203.8.4.4 Five or fewer persons receiving care in a dwelling unit. A facility such as the above within a *dwelling unit* and having five or fewer persons receiving *custodial care* shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code*.

203.8.4.5 Drop-in/short-term child care. Drop-in/short-term child care facility as defined in N.C.G.S. 110-86(2)(d) & (d1) shall be classified as Group E.

MERCANTILE GROUP M

203.9 Mercantile Group M. Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public. Mercantile occupancies shall include, but not be limited to, the following:

Department stores

Drug stores

Greenhouses for display and sale of plants that provide public access.

Markets

Motor fuel-dispensing facilities

Retail or wholesale stores

Sales rooms

203.9.1 Motor fuel-dispensing facilities. Motor fuel-dispensing facilities shall comply with Section 406.7 of the *International Building Code* and Chapter 23.

203.9.2 Quantity of hazardous materials. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored or displayed in a single *control area* of a Group M occupancy shall not exceed the quantities in Table 5003.11.1.

RESIDENTIAL GROUP R

203.10 Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code*. Group R occupancies not constructed in accordance with the *International Residential Code* as permitted by Sections 310.4.1 and 310.4.2 of the *International Building Code* shall comply with Section 420 of the *International Building Code*.

203.10.1 Residential Group R-1. Residential Group R-1 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*)

Open air camp cabin (*transient*) with 17 to 36 occupants

203.10.2 Residential Group R-2. Residential Group R-2 occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

Apartment houses

Congregate living facilities (nontransient) with more than 16 occupants

Boarding houses (*nontransient*)

Convents

Dormitories

Fraternities and sororities

Monasteries

Hotels (nontransient)

Live/work units

Motels (nontransient)

Open air camp cabin (nontransient) with 17 to 36 occupants

Vacation timeshare properties

203.10.3 Residential Group R-3. Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

Buildings that do not contain more than two *dwelling units*

Adult day care facilities that provide accommodations for five or fewer persons receiving care

Child day care facilities that provide accommodations for eight or fewer persons with no more than five for a pre-school for less than 24 hours.

Congregate living facilities (nontransient) with 16 or fewer occupants

Boarding houses (nontransient)

Convents

Dormitories

Fraternities and sororities

Monasteries

Congregate living facilities (*transient*) with 10 or fewer occupants

Boarding houses (*transient*)

Lodging houses (*Bed and Breakfast*) with eight or fewer guest rooms

~~Licensed small residential care facilities complying with Section 428.3 of the *North Carolina Building Code*.~~

Open air camp cabin with 16 or fewer occupants

~~*Respite care facilities* licensed as small residential care facilities~~

203.10.3.1 Care facilities within a dwelling. Deleted. See *North Carolina Residential Code* Section R332**.** ~~Care facilities for five 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 or Section P2904 of the *International Residential Code*.~~

~~**Exception:** *Respite care facilities* shall be provided with an NFPA 13 sprinkler system complying with Section 903.3.1.1.~~

203.10.3.2 *Lodging houses* /*Bed and Breakfast*. Owner-occupied *lodging houses* with eight or fewer guest rooms shall be permitted to be constructed in accordance with the *International Residential Code*.

203.10.4 Residential Group R-4. Residential Group R-4 occupancy shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive *custodial care*. Buildings of Group R-4 shall be classified as one of the occupancy conditions specified in Section 203.10.4.1 or 203.10.4.2. This group shall include, but not be limited to, the following:

Alcohol and drug centers

Assisted living facilities

Adult day care facilities, less than 24-hour basis

Child day care facilities, less than 24-hour basis

Congregate care facilities

Group homes

Halfway houses

Large Residential Care Facilities complying with Section 430.5 of the *International Building Code*.

Residential board and care facilities

Respite care facilities licensed as large residential care facilities

Social rehabilitation facilities

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code.

203.10.4.1 Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

203.10.4.2 Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

STORAGE GROUP S

203.11 Storage Group S. Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy.

203.11.1 Accessory storage spaces. A room or space used for storage purposes that is accessory to another occupancy shall be classified as part of that occupancy. The aggregate area of such rooms or spaces shall not exceed the allowable area limits of Section 508.2 of the *International Building Code*.

203.11.2 Combustible storage. ~~High-piled stock or rack storage, or~~ Attic, under-floor and concealed spaces used for storage of combustible materials, shall be in accordance with Section 413 of the *International Building Code*.

203.11.2.1 High-piled storage. High-piled combustible storage or rack storage shall be in accordance with Section 413 of the *International Building Code* and Chapter 32.

203.11.3 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

Aerosol products, Levels 2 and 3

Aircraft hangar (storage and repair)

Bags: cloth, burlap and paper

Bamboos and rattan
Baskets

Belting: canvas and leather

Books and paper in rolls or packs

Boots and shoes

Buttons, including cloth covered, pearl or bone

Cardboard and cardboard boxes

Clothing, woolen wearing apparel

Cordage

Dry boat storage (indoor)

Furniture

Furs

Glues, mucilage, pastes and size

Grains

Horns and combs, other than celluloid

Leather

Linoleum

Lumber

Motor vehicle *repair garages* complying with the maximum allowable quantities of *hazardous materials* listed in Table 5003.1.1 (see the *North Carolina Building Code*, Section 406.8)

Photo engravings

Resilient flooring

Self-service storage facility (mini-storage)

Silks

Soaps

Sugar

Tires, bulk storage of

Tobacco, cigars, cigarettes and snuff

Upholstery and mattresses

Wax candles

203.11.3.1 Aircraft hangers. Aircraft hangars used for storage or repair shall comply with Section 412.3 of the *International Building Code*.

203.11.3.2 Motor vehicle repair garages Motor vehicle *repair garages* shall comply with Section 406.8 of the *International Building Code* and Chapter 23.

203.11.4 Low-hazard storage, Group S-2. Storage Group S-2 occupancies include, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic *trim*, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not be limited to, storage of the following:

Asbestos

Beverages up to and including 16-percent alcohol

Cement in bags

Chalk and crayons

Dairy products in nonwaxed coated paper containers

Dry cell batteries

Electrical coils

Electrical motors

Empty cans

Food products

Foods in noncombustible containers

Fresh fruits and vegetables in nonplastic trays or containers

Frozen foods

Glass

Glass bottles, empty or filled with noncombustible liquids

Gypsum board

Inert pigments

Ivory

Meats

Metal cabinets

Metal desks with plastic tops and *trim*

Metal parts

Metals

Mirrors

Oil-filled and other types of distribution transformers

Public parking garages, open or enclosed

Porcelain and pottery

Stoves

Talc and soapstones

Washers and dryers

203.11.4.1 Public parking garages. Public parking garages shall comply with Section 406.4 of the *International Building Code* and the additional requirements of Section 406.5 of the *International Building Code* for *open parking garages* or Section 406.6 of the *International Building Code* for enclosed parking garages.

UTILITY AND MISCELLANEOUS GROUP U

203.12 Utility and Miscellaneous, Group U. Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

Agricultural buildings

Aircraft hangars, accessory to a one- or two-family residence (see the *North Carolina Building Code*, Section 412.4)

Barns

Carports

Communication equipment structures with a *gross floor area* of less than 1,500 square feet (139 m^2)

Fences and ground signs more than 7 feet (1829 mm) in height

Grain silos, accessory to a residential occupancy

Livestock shelters

Photovoltaic panel system (mounted at grade)

Private garages

Retaining walls

Sheds

Stables

Tanks

Towers

203.12.1 Greenhouses. *Greenhouses* not classified as another occupancy shall be classified as Use Group U.

203.12.2 Private garages and carports. *Private garages* and carports shall comply with Section 406.3 of the *International Building Code*.

203.12.3 Residential aircraft hangars. Aircraft hangars accessory to a one- or two-family residence shall comply with Section 412.4 of the *International Building Code*.

Part II—General Safety Provisions

CHAPTER 3
GENERAL REQUIREMENTS

~~**User note:**~~

~~***About this chapter:*** *Chapter 3 provides general requirements for asphalt kettles, combustible waste material, ignition sources, motion picture projection rooms and film, open burning, recreational fires, portable outdoor fireplaces, open flames, powered industrial trucks and equipment, smoking, vacant premises, vehicle impact protection, fueled equipment, indoor displays, general storage, outdoor pallet storage, hazards to fire fighters, landscaped roofs, laundry carts, mobile food preparation vehicles, additive manufacturing (3D printing) and artificial combustible vegetation. These are intended to improve premises safety for everyone, including construction workers, tenants, operations and maintenance personnel, and emergency response personnel.*~~

303.8 Roofing kettles. Roofing kettles shall be constructed of noncombustible materials.

303.9 Fuel containers under air pressure. Fuel containers that operate under air pressure shall not exceed 20 gallons (76 L) in capacity and shall be *approved*.

SECTION 304
COMBUSTIBLE WASTE MATERIAL

304.4 Valet Trash Collection Services for R-2 Apartment Occupancies.

304.4.1. Combustible trash in a means of egress. Combustible trash or recyclable materials shall not be placed in *exits*, *exit passageways*, enclosures for *stairways* or *ramps*, *corridors*, elevator lobbies, or on egress balconies, except as permitted by Section 304.4.2.

304.4.2. Combustible trash or recyclable materials in *corridors* or on egress balconies of Group R-2 occupancies that are awaiting scheduled valet trash collection is allowed as described in Sections 304.4.2.1 through 304.4.2.3.

304.4.2.1. Trash or recyclable materials awaiting valet trash collection shall only be placed in *a corridor* or on an egress balcony within 5 hours of scheduled pickup and shall not obstruct the minimum egress width required by Section 1031.

304.4.2.2. Trash or recyclable materials awaiting valet trash collection shall be placed completely inside of one or more containers with a closed lid that complies with Section 304.4.2.3. Additional trash or recyclable material placed outside of the containers, as described in 304.4.2.3, are prohibited.

304.4.2.3. Containers used for valet trash collection shall not exceed a capacity of 2.0 cubic feet (15 gallons, 0.06 cubic meters) and shall be provided with tight-fitting or self-closing lids. Containers and lids located in an area that is protected by fire sprinklers shall be constructed entirely of noncombustible materials or materials that meet a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation. Containers and lids shall be *listed* or bear the label of an approved agency that validates compliance with this requirement.

304.4.3 Policies and procedures. Apartment management shall have written policies and procedures in place, enforce compliance, and upon request provide a copy of such policies and procedures to the authority having jurisdiction.

SECTION 310
SMOKING

310.9 Hookah or water pipe use. The use of hookahs or similar devices within buildings shall comply with all of the following:

1. An *approved* ventilation system is required.
   1.1. The room or building shall comply with the *North Carolina Mechanical Code* Section 403.3 for a smoking lounge.
   1.2. Carbon monoxide accumulation shall be controlled in accordance with the *North Carolina Mechanical Code* Section 502.
2. Coals shall be transported from the preparation area in an *approved* noncombustible container.
3. Hookah pipes shall be located and positioned in such a manner as to prevent overturning.
4. Disposal, use, or handling of ashes and coals shall comply with Sections 305.1 and 305.2.

SECTION 311
VACANT PREMISES

311.2.2 Fire protection. Fire protection systems shall be maintained in an operable condition at all times. ~~Fire alarm, sprinkler and standpipe systems shall be maintained in an operable condition at all times.~~

Exceptions:

1. Where the premises have been cleared of all combustible materials and debris and, in the opinion of the *fire code official*, the type of construction, *fire separation distance* and security of the premises do not create a fire hazard.
2. Where *approved* by the *fire code official*, ~~Where~~ buildings that will not be heated and where *fire protection systems* will be exposed to freezing temperatures, fire alarm and *automatic sprinkler systems* are permitted to be placed out of service and standpipes are permitted to be maintained as dry systems (without an automatic water supply), provided that the building does not have contents or storage, and windows, doors and other openings are secured to prohibit entry by unauthorized persons.
3. Where *approved* by the *fire code official*, fire alarm and *automatic sprinkler systems* are permitted to be placed out of service in seasonally occupied buildings: that will not be heated; where fire protection systems will be exposed to freezing temperatures; where *fire areas* do not exceed 12,000 square feet (1115 m^2); and that do not store motor vehicles or hazardous materials.

SECTION 314
INDOOR DISPLAYS

314.4 Vehicles. Liquid-fueled or gaseous-fueled vehicles, aircraft, boats or other motorcraft shall not be located indoors except as follows:

1. The engine starting system is made inoperable or batteries are disconnected except where the *fire code official* requires that the batteries remain connected to maintain safety features.

   Exception: Alternative-fueled vehicles in which manufacturer prohibits the disconnection of power supply.

2. Fuel in fuel tanks does not exceed one-quarter tank or 5 gallons (19 L) (whichever is least).

   Exception: Diesel-fueled vehicles, the maximum fuel amount permitted shall be 20 gallons.

3. Fuel tanks and fill openings are closed and sealed to prevent tampering and the release of vapors.
4. Vehicles, aircraft, boats or other motorcraft equipment are not fueled or defueled within the building.

SECTION 315
GENERAL STORAGE

315.3.1 Ceiling clearance. Storage shall be maintained 2 feet (610 mm) or more below the ceiling in nonsprinklered areas of buildings or not less than 18 inches (457 mm) below sprinkler head deflectors in sprinklered areas of buildings.

Exceptions:

1. The 2-foot (610 mm) ceiling clearance is not required for storage along walls in nonsprinklered areas of buildings.
2. The 18-inch (457 mm) ceiling clearance is not required for storage along walls in areas of buildings equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.

SECTION 316
HAZARDS TO FIRE FIGHTERS

316.6.3 Parking. ~~Transient~~ On grade parking of passenger vehicles is allowed if all of the following are met: ~~as follows:~~

1. The utility provider grants written permission to park within their easement or right of way;
2. Each vehicle shall be 10,000 pounds or less gross vehicle weight;
3. The lowest conductor of the transmission line shall be 25 feet (7620 mm) above the parking lot surface;
4. The transmission line voltage shall be 230kv or less ~~and~~
5. ~~Transient parking is a time period of no more than 12 consecutive hours~~

SECTION 319
MOBILE FOOD PREPARATION VEHICLES

319.11 Operation. Operation of *mobile food preparation vehicles* shall be in accordance with Sections 319.11.1 through 319.11.1.2.

319.11.1 Stability. M*obile food preparation vehicles* shall be stabilized against movement when parked for food prep operations in accordance with Sections 319.11.1.1 through 319.11.1.2.

319.11.1.1 Chock blocks/wheel stops. Not less than two chock blocks not less than 5 inches by 5 inches by 12 inches (127 mm by 127 mm by 305 mm) in size and dished to fit the contour of the tires shall be used during food prep operations of *mobile food preparation vehicles*.

319.11.1.2 Brakes. Emergency brake shall be set, and the wheels shall be blocked to prevent rolling.

SECTION 322
TEMPORARY OVERFLOW SHELTER

322.1 General. Existing Group A-2 and A-3 occupancies shall be permitted to provide facilities for temporary overflow emergency shelters for the homeless provided that all of the following conditions are met and approved by the local building and *fire code official*.

322.1.1 Occupant load and age. The maximum number of homeless occupants is 20 individuals who are ambulatory. The homeless occupants must be 18 years of age or older.

Exception: Occupants may be less than 18 years of age if the temporary shelter meets all of the following:
1. Is intended to serve homeless families with children and their parents or other legal guardian;
2. Consists of a group of churches or other nonprofit religious entities that have agreed to host the shelter occupants on the premises of each church or religious entity on a rotating basis; and
3. Equipped with smoke detectors meeting applicable code provisions for such devices in all sleeping areas.

322.1.2 Construction type. The building must be of Type I, II, or III construction.

322.1.3 Staff. The temporary overflow emergency shelter must be staffed by a minimum of two individuals, 21 years of age or older, trained in accordance with Chapter 4 of the *North Carolina Fire Code* and at least one trained individual shall be awake to monitor the sleeping room and restrooms throughout the time the facility is occupied by the homeless.

322.1.4 Fire alarm and detection systems. Functioning smoke detection and a local fire alarm system in accordance with Section 907.2.8 shall be provided throughout the sleeping room and exit access corridors and stairs of the temporary overflow emergency shelter.

The building owner shall submit documentation illustrating that the fire alarm system is approved and that all emergency batteries have been tested and are operational.

322.1.5 Means of egress. There shall be a minimum of two separate code compliant means of egress serving the temporary overflow emergency shelter. An evacuation route approved by the local building and fire code officials shall be posted and be in compliance with Sections 403 and 404 of this code.

322.1.5.1 Illumination. The temporary overflow emergency shelter sleeping room and exit access corridors and stairs shall have unswitched illumination and emergency powered illumination with a duration of not less than 90 minutes.

322.1.6 Automatic sprinkler system. No fire protection sprinkler system is required in accordance with Section 903.2.8, Exception 2.

322.1.7 Ventilation and temperature control. Heating, cooling, and ventilation must be provided by equipment installed and approved for such use. Use of space heaters shall be prohibited.

322.1.8 Fire extinguishers. There must be an adequate number of fire extinguishers to serve the temporary overflow emergency shelter as determined by the local fire marshal. Travel distance to an approved fire extinguisher shall not exceed 50 feet (15 240 mm). Minimum rating of extinguishers shall be 3A:40B:C.

322.1.9 Occupant restrictions. No smoking is permitted in the temporary overflow emergency shelter.

322.1.10 Permits. Temporary overflow emergency shelters must be approved by the local code official for occupancy by issuance of an approved occupancy permit. Life Safety drawings of the temporary overflow emergency shelter sealed by a registered design professional must be provided for local code official review and approval.

Occupancy of a temporary overflow emergency shelter shall be for a maximum of 150 calendar days within any 365-day time span.

322.1.11 Accessibility. For temporary overflow emergency shelters, compliance with the *North Carolina Building Code* Chapter 11 and Section 1009 is not required provided that the local jurisdiction has other shelter facilities that are accessible by the disabled.

SECTION 323
GROUP E IN CHURCHES, PRIVATE AND PUBLIC SCHOOLS AND LICENSED CHILD DAY CARE FACILITIES

323.1 Group E in churches, private and public schools, and licensed child day care facilities. Rooms used for first grade children and younger shall be located on the level of exit discharge. Rooms used for second grade children shall not be located more than one story above the level of exit discharge.

SECTION 324
TEMPORARY SLEEPING UNITS FOR DISASTER RELIEF WORKERS

324.1 General. This section shall apply to temporary use of *existing buildings* for purposes of providing sleeping units for volunteer disaster relief workers supporting a disaster declaration issued by the Governor of North Carolina. *Existing buildings*

shall be permitted to provide temporary sleeping facilities for disaster relief workers provided that all the provisions of this section are met and *approved* by the local code officials. Facilities complying with 324 shall not require compliance with other provisions of this code or the Building Code.

Exception: *Buildings* containing the following occupancies or uses shall not be used for temporary *sleeping units* for disaster relief workers:
1. Group F
2. Group H
3. Group S-1 vehicle repair garage
4. Group S-1 bulk tire storage
5. Woodworking operations

324.2 Permit required. An operational permit as designated in 105.5.53 shall be required.

324.3 Short-Term Occupancy. Short-term occupancies meeting the requirements of this section shall be permitted in *existing buildings* that have a current certificate of occupancy and connected electrical service. Use of a *building* or portion thereof for a short-term occupancy shall not exceed two days within 30 consecutive days.

324.3.1 Fire alarm and detection systems. Functioning smoke detection as required for the *existing building* or single station battery operated *smoke alarms* where no system exists shall be provided throughout the sleeping room, *exit access corridors*, and *stairs* serving the *sleeping units* per 907.2.11. Carbon monoxide detection devices shall be provided as required by 915.1.4 when fuel fired appliances are present.

324.3.2 Ventilation and temperature control. Heating, cooling, and *ventilation* must be provided by equipment installed and *approved* for such use. Use of portable space heaters shall be prohibited.

321.3.3 Plumbing fixtures. Plumbing fixtures shall be provided as required for Group R-2 by the NC Plumbing Code, Section 403 for the number of disaster relief workers occupying the *building*. Temporary facilities are permitted as *approved* by the local code official.

324.3.4 Accessibility. *Sleeping units* for temporary disaster relief workers complying with the NC Building Code, Chapter 11 and Section 1009 are not required provided that the building owner or supporting organization has other sleeping facilities that are accessible by the disabled within the same jurisdiction as the temporary *sleeping units*.

324.4 Long-term Occupancy. Long-term occupancies meeting the requirements of this section and 321.3 shall be permitted in *existing buildings* that have a current certificate of occupancy and connected electrical service. Long-term occupancies are for periods exceeding Short-term occupancy as designated in Section 321.3 with a maximum of 180 consecutive calendar days. The local fire official may extend the initial time period up to an additional 180-day period as often as needed if the building owner or his or her designee provides documentation satisfactory to the local fire official that an extension of time is necessary to support local disaster relief efforts and the fire official verifies that the building remains in compliance with this section.

324.4.1 Occupant load and age. The maximum number of disaster relief workers permitted in the occupancy is 20 ambulatory individuals. The disaster relief workers must be 18 years of age or older.

Exception: Occupants may be less than 18 years of age if the sleeping unit meets all of the following conditions:

1. Is intended to serve disaster relief worker families with children and their parents or other legal guardian; and
2. Is equipped with *smoke alarms* meeting applicable code provisions for such devices in all sleeping areas.

324.4.2 Staff. The sleeping units must be staffed by a minimum of two individuals of 21 years of age or older trained in accordance with Chapter 4 of the NC Fire Code and at least one trained individual shall be awake to monitor the sleeping room and restrooms throughout the time the facility is occupied by the disaster relief workers.

324.4.3 Fire alarm and detection systems. Functioning smoke detection as required for the existing building or *single station smoke alarms* where no system exists shall be provided throughout the sleeping room, *exit access corridors*, and *stairs* serving the *sleeping units* per 907.2.11. Carbon monoxide detection devices shall be provided as required by 915.1.4 when

fuel fired appliances are present. Building owner or his or her designee shall submit documentation illustrating that the *smoke alarm* is *approved* and that all emergency batteries have been tested and are operational.

324.4.4 Fire extinguishers. There must be an adequate number of fire extinguishers to serve the *sleeping units* as determined by the local fire code official. Travel distance to an approved fire extinguisher shall not exceed 50 feet. Minimum rating of extinguishers shall be 3A-40BC.

324.4.5 Automatic sprinkler system. No fire protection sprinkler system is required per 903.2.8, Exception #6. Any *existing* fire sprinkler system shall be operational.

Exception: Sprinkler system required by 324.4.7.

324.4.6 Means of egress. There shall be a minimum of two separate code compliant *means of egress* serving the *sleeping units*. An evacuation route approved by the local *fire code official* shall be posted and be in compliance with Sections 401, 403, 404, and 406 of the NC Fire Code.

324.4.6.1 Illumination. The disaster relief workers sleeping rooms and exit access corridors and stairs shall have unswitched illumination and emergency powered illumination with a duration of not less than 90-minutes.

324.4.7 Location of sleeping units. *Sleeping units* above or below the *level of exit discharge* are required to have a fire sprinkler system complying with 903.3 or an automatic smoke detection system complying with 907.2.8.2.

324.4.8 Occupant restrictions.
1. No smoking shall be permitted in the facility.
2. Candles, incense and similar open-flame-producing items shall not be allowed within the *sleeping units* or areas immediately adjacent to the *sleeping units*.
3. No temporary cooking equipment shall be permitted in the facility.

SECTION 325
INDOOR TRADE SHOWS AND EXHIBITIONS

325.1 Scope. Indoor trade shows and exhibitions with temporary vendor displays or booths within any indoor occupancy classification shall be in accordance with Appendix N and all other applicable requirements of this code.

CHAPTER 4
EMERGENCY PLANNING AND PREPAREDNESS

~~**User note:**~~

~~***About this chapter:*** Chapter 4 addresses the human contribution to life safety in buildings when a fire or other emergency occurs. The requirements for continuous training and scheduled fire, evacuation and lockdown drills can be as important as the required periodic inspections and maintenance of built-in fire protection features. The level of preparation by the occupants also improves the emergency responders' abilities during an emergency. The International Building Code® focuses on built-in fire protection features, such as automatic sprinkler systems, fire-resistance-rated construction and properly designed egress systems, whereas this chapter fully addresses the human element.~~

SECTION 403
EMERGENCY PREPAREDNESS REQUIREMENTS

403.11.5 Other occupancy groups having a fire alarm system. An *approved* fire safety and evacuation plan shall be prepared and maintained.

SECTION 405
EMERGENCY EVACUATION DRILLS

405.3 Frequency. Required emergency evacuation drills shall be held at the intervals specified in Table 405.3 or more frequently where necessary to familiarize all occupants with the drill procedure.

TABLE 405.3
FIRE AND EVACUATION DRILL
FREQUENCY AND PARTICIPATION

GROUP OR OCCUPANCY	FREQUENCY	PARTICIPATION
Group A	Quarterly	Staff
Group B[a]	Annually	All occupants
Group B[c]	Quarterly	All Occupants
Group B (Ambulatory care facilities)	Quarterly on each shift	Staff
Group B[a] (Clinic, outpatient)	Annually	Staff
Group E	Monthly[a]	All occupants
Group F	Annually	Employees
Group I-1	Semiannually on each shift	All occupants
Group I-2	Quarterly on each shift	Staff
Group I-3	Quarterly on each shift[a]	Staff
Group I-4	Monthly on each shift	All occupants
Group R-1	Quarterly on each shift	Employees
Group R-2[b]	Four annually	All occupants
Group R-4	Semiannually on each shift	All occupants

a. Emergency evacuation drills are required in Group B buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.

b. Emergency evacuation drills in Group R-2 college and university buildings shall be in accordance with Section 403.9.2.1. Other Group R-2 occupancies shall be in accordance with Section 403.9.2.2.

c. Cooperative innovative high school programs taught at colleges, community colleges or universities when required to have a fire alarm system in accordance with Section 907.2.2 or as required in accordance with Section 403.4

Part III—Building and Equipment Design Features

CHAPTER 5
FIRE SERVICE FEATURES

~~**User note:**~~

~~***About this chapter:*** *Chapter 5 provides requirements that apply to all buildings and occupancies and pertain to access roads, access to building openings and roofs, premises identification, key boxes, fire protection water supplies, fire command centers, fire department access to equipment and emergency responder radio coverage in buildings. Although many safety features are part of the building design, features such as proper fire department access roads and radio coverage are necessary in case of emergency and are important tools for emergency responders for public safety and their own safety.*~~

SECTION 502
DEFINITIONS

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

FIRE FLOW.

FIRE-FLOW CALCULATION AREA.

SECTION 503
FIRE APPARATUS ACCESS ROADS

503.1.1 Buildings and facilities. *Approved* fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of this section and shall extend to within 150 feet (45 720 mm) of all portions of the facility and all portions of the *exterior walls* of the first story of the building as measured by an *approved* route around the exterior of the building or facility.

Exceptions:

1. The *fire code official* is authorized to increase the dimension of 150 feet (45 720 mm) where any of the following conditions occur:
   1.1. ~~When t~~ The building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1, or 903.3.1.2 or 903.3.1.3~~., the dimension shall increase to a maximum of 200 feet (60 960 mm).~~
   1.2. Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an *approved* alternative means of fire protection is provided.
   1.3. There are not more than two Group R-3 or Group U occupancies.
2. Where *approved* by the *fire code official*, fire apparatus access roads shall be permitted to be exempted or modified for solar photovoltaic power generation facilities.

503.1.1.1 Buildings exceeding three stories or 30 feet in height. Buildings or facilities exceeding 30 feet (9144 mm) or three stories in height shall have not fewer than two means of fire apparatus access for each structure.

503.1.1.2 Buildings exceeding 62,000 square feet in area. Buildings or facilities having a gross *building area* of more than 62,000 square feet (5760 m2) shall be provided with two separate and *approved* fire apparatus access roads.

Exception: Projects having a gross *building area* of up to 124,000 square feet (11 520 m2) that have a single *approved* fire apparatus access road where all buildings are equipped throughout with *approved automatic sprinkler systems.*

503.1.2 Additional access. The *fire code official* is authorized to require more than one fire apparatus access road based on the potential for impairment of a single road by vehicle congestion, condition of terrain, or climatic conditions. ~~or other factors that could limit access.~~

503.1.4 Aerial fire apparatus access roads. Aerial fire apparatus access roads shall be provided in accordance with Sections 503.1.4.1 through 503.1.4.4

503.1.4.1 Where required. Where the vertical distance between the *grade plane* and the highest roof surface exceeds 30 feet (9144 mm), approved aerial fire apparatus access roads shall be provided. For purposes of this section, the highest roof surface shall be determined by measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater.

Exception: Where *approved* by the *fire code official*, buildings of Type IA, Type IB or Type IIA construction equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 and having fire fighter access through an enclosed *stairway* with a Class I standpipe from the lowest level of fire department vehicle access to all roof surfaces.

503.1.4.2 Width. Aerial fire apparatus access roads shall have a minimum unobstructed width of 26 feet (7925 mm), exclusive of shoulders, in the immediate vicinity of the building or portion thereof.

503.1.4.3 Proximity to building. One or more of the required access routes meeting this condition shall be located not less than 15 feet (4572 mm) and not greater than 30 feet (9144 mm) from the building and shall be positioned parallel to one entire side of the building. The side of the building on which the aerial fire apparatus access road is positioned shall be approved by the *fire code official*.

503.1.4.4 Obstructions. Overhead utility and power lines shall not be located over the aerial fire apparatus access road or between the aerial fire apparatus road and the building. Other obstructions shall be permitted to be placed with the approval of the *fire code official*.

503.1.5 Multiple-family residential developments. Fire apparatus access roads for multi-family dwellings shall be provided in accordance with Sections 503.1.5.1 through 503.1.5.2

503.1.5.1 Projects having more than 100 dwelling units. Multiple-family residential projects having more than 100 *dwelling units* shall be equipped throughout with two separate and *approved* fire apparatus access roads.

Exception: Projects having up to 200 *dwelling units* shall have not fewer than one *approved* fire apparatus access road where all buildings, including nonresidential occupancies, are equipped throughout with *approved automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2.

503.1.5.2 Projects having more than 200 dwelling units. Multiple-family residential projects having more than 200 *dwelling units* shall be provided with two separate and *approved* fire apparatus access roads regardless of whether they are equipped with an *approved automatic sprinkler system*.

503.1.6 Remoteness. Where two fire apparatus access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the lot or area to be served, measured in a straight line between accesses.

Exception: For one- or two-family dwelling residential developments where compliance is technically infeasible because of road connectivity limitations, real property dimensions or limitations, real property acquisition constraints, or environmental constraints, as determined by the property owner or developer, the *fire code official* shall either not require two fire apparatus access roads or allow for alterations that provide for fire apparatus access road remoteness to the maximum extent technically feasible.

503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (6096 mm), exclusive of shoulders, except for *approved* security gates in accordance with Section 503.6, and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm).

Exception: Nonwithstanding the provisions in Section 503.2.1.1**, f**ire apparatus access roads constructed and maintained in accordance with North Carolina DOT Minimum Construction Standards for Subdivision Roads, when approved by the fire code official.

503.2.1.1 Access road width at a hydrant. Where a fire hydrant is located on a *fire apparatus access road*, the minimum road width shall be 26 feet (7925 mm) for a distance of 20 feet on each side of the hydrant, exclusive of shoulders.

~~**503.2.3 Surface.** Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced so as to provide all-weather driving capabilities.~~

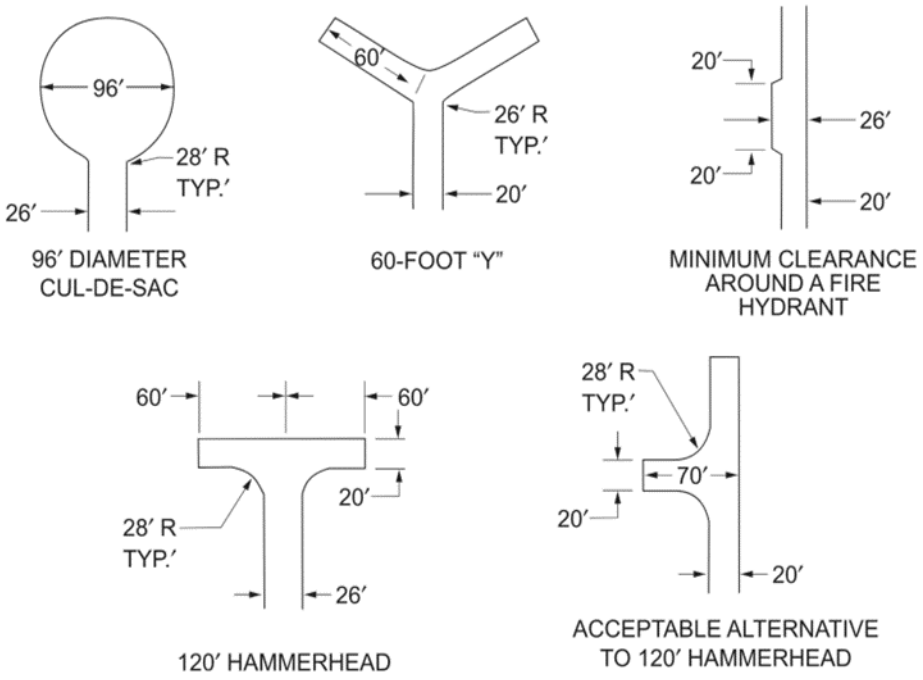
503.2.3 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall be accessible to fire department apparatus by way of an *approved fire apparatus access road* with an asphalt, concrete or other *approved* driving surface capable of supporting the imposed load of fire apparatus.

503.2.5 Dead ends. Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) in length shall be provided with ~~an *approved* area for turning around fire apparatus~~ a turnaround as required in Table 503.2.5.

TABLE 503.2.5
REQUIREMENTS FOR DEAD-END
FIRE APPARATUS ACCESS ROADS

LENGTH (feet)	WIDTH (feet)	TURNAROUNDS REQUIRED
0-150	20	None required
151-500	20	120-foot Hammerhead, 60-foot "Y" or 96-foot diameter cul-de-sac in accordance with Figure 503.2.5
501-750	26	120-foot Hammerhead, 60-foot "Y" or 96-foot diameter cul-de-sac in accordance with Figure 503.2.5
Over 750	As required by the *fire code official*	

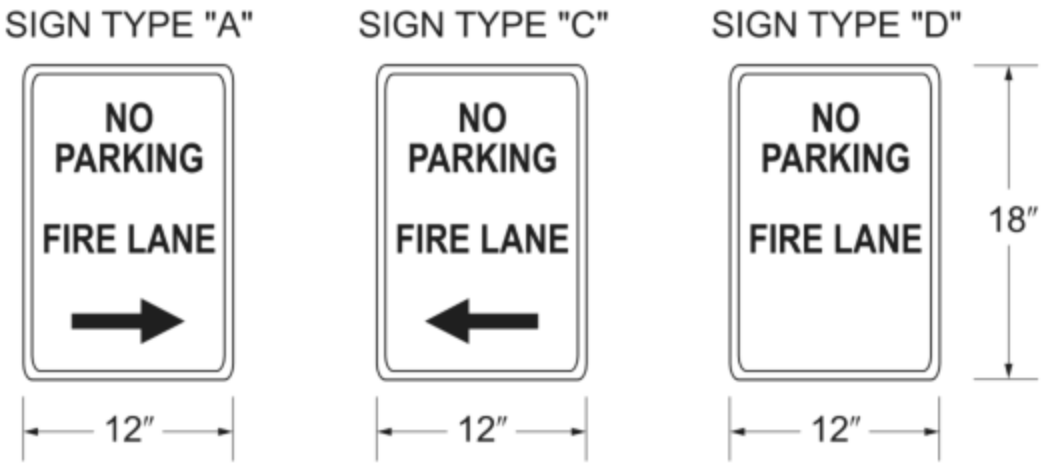
Figure 503.2.5



For SI: 1 foot = 304.8 mm.

503.3 Marking. Where required by the *fire code official*, *approved* signs or other *approved* notices or markings that include the words "NO PARKING—FIRE LANE" shall be provided for fire apparatus access roads to identify such roads or prohibit the obstruction thereof. The means by which *fire lanes* are designated shall be maintained in a clean and legible condition at all times and be replaced or repaired when necessary to provide adequate visibility.

503.3.1 Sign size and color. Signs shall have a minimum dimension of 12 inches (305 mm) wide by 18 inches (457 mm) high and have red letters on a white reflective background.



~~**503.6 Security gates.** The installation of security gates across a fire apparatus access road shall be *approved* by the *fire code official*. Where security gates are installed, they shall have an *approved* means of emergency operation. The security gates and the emergency operation shall be maintained operational at all times. Electric gate operators, where provided, shall be *listed* in accordance with UL 325. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F2200.~~

503.6 *Fire apparatus access road* gates. The installation of gates across a *fire apparatus access road* shall be *approved* by the *fire code official*. Gates securing the *fire apparatus access roads* shall comply with all of the following criteria:

1. Where a single gate is provided, the gate width shall be not less than 20 feet (6096 mm). Where a fire apparatus road consists of a divided roadway, the gate width shall be not less than 12 feet (3658 mm).
2. Gates shall have an *approved* means of emergency operation and constructed to allow manual operation by one person.
3. Gates shall be of the horizontal swing, horizontal slide, vertical lift or vertical pivot swinging or sliding type and approved by the *fire code official*.
4. Gate components, to include emergency operation method, shall be maintained in an operative condition at all times and replaced or repaired when defective.
5. Electric gates shall be equipped with a means of opening the gate by fire department personnel for emergency access. Emergency opening devices shall be *approved* by the *fire code official*.
6. Methods of locking shall be submitted to the *fire code official* for approval.
7. Electric gate operators, where provided, shall be *listed* in accordance with UL 325.
8. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F2200.

SECTION 505
PREMISES IDENTIFICATION

505.1 Address identification. New and existing buildings shall be provided with *approved* address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property. Address identification characters shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall not be spelled out. Each character shall be not less than 6 ~~4~~ inches (153 mm) ~~(102 mm)~~ high with a minimum stroke width of ¾ ~~½~~ inch (20 mm) ~~(12.7 mm)~~. Where required by the *fire code official*, address identification shall be provided in

additional *approved* locations to facilitate emergency response. Where access is by means of a private road and the building cannot be viewed from the *public way*, a monument, pole or other sign or means shall be used to identify the structure. Address identification shall be maintained.

505.1.1 Suite/Room identification. Where numerical addresses are posted to identify suites or rooms within buildings, the first digit of the suite or room number shall match the floor number signage.

SECTION 507
FIRE PROTECTION WATER SUPPLIES

~~**507.3 Fire flow.** Fire flow requirements for buildings or portions of buildings and facilities shall be determined by the ISO Fire Suppression Rating Schedule, NFPA 1142 or other *approved* method.~~

507.3 Fire flow. Fire flow requirements for buildings or portions of buildings and facilities as determined by the *fire code official* shall be in accordance with Sections 507.3.1 through 507.3.4.

507.3.1 One- and two-family dwellings and townhouses. The minimum fire-flow and flow duration requirements for one- and two-family *dwellings* and *townhouses* shall be as specified in Section 511.

507.3.2 Buildings other than one- and two-family dwellings and townhouses. The minimum fire-flow and flow duration for buildings other than one- and two-family *dwellings* and *townhouses* shall be as specified in Tables T507.3(1) and T507.3(2) or ISO Guide for Determination of Needed Fire Flow.

507.3.2.1 Areas without water supply systems or with limited water supply systems. The fire code official is authorized to utilize NFPA 1142, the *International Wildland-Urban Interface Code* or other *approved* method for areas without water supply systems or those areas with mains less than 6 inches in diameter.

507.3.3 Water supply for buildings equipped with an automatic sprinkler system. For buildings equipped with an *approved automatic sprinkler system*, the water supply shall be capable of providing the greater of:

1. The *automatic sprinkler system* demand, including hose stream allowance.
2. The required *fire flow*.

TABLE 507.3(1)
REQUIRED FIRE FLOW FOR BUILDINGS OTHER THAN ONE- AND TWO-FAMILY DWELLINGS AND TOWNHOUSES

AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
No automatic sprinkler system	Value in Table 507.3(2)	Duration in Table 507.3(2)
Section 903.3.1.1 of the *International Fire Code*	25% of the value in Table 507.3(2)[a]	Duration in Table 507.3(2) at the reduced flow rate
Section 903.3.1.2 of the *International Fire Code*	25% of the value in Table 507.3(2)[b]	Duration in Table 507.3(2) at the reduced flow rate

For SI: 1 gallon per minute = 3.785 L/m.
a. The reduced fire flow shall be not less than 1,000 gallons per minute.
b. The reduced fire flow shall be not less than 1,500 gallons per minute.

TABLE 507.3(2)
REFERENCE TABLE FOR TABLE 507.3(1)

FIRE-FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		

0–22,700	0–12,700	0–8,200	0–5,900	0–3,600	1,500	
22,701–30,200	12,701–17,000	8,201–10,900	5,901–7,900	3,601–4,800	1,750	
30,201–38,700	17,001–21,800	10,901–12,900	7,901–9,800	4,801–6,200	2,000	
38,701–48,300	21,801–24,200	12,901–17,400	9,801–12,600	6,201–7,700	2,250	2
48,301–59,000	24,201–33,200	17,401–21,300	12,601–15,400	7,701–9,400	2,500	
59,001–70,900	33,201–39,700	21,301–25,500	15,401–18,400	9,401–11,300	2,750	
70,901–83,700	39,701–47,100	25,501–30,100	18,401–21,800	11,301–13,400	3,000	
83,701–97,700	47,101–54,900	30,101–35,200	21,801–25,900	13,401–15,600	3,250	3
97,701–112,700	54,901–63,400	35,201–40,600	25,901–29,300	15,601–18,000	3,500	
112,701–128,700	63,401–72,400	40,601–46,400	29,301–33,500	18,001–20,600	3,750	
128,701–145,900	72,401–82,100	46,401–52,500	33,501–37,900	20,601–23,300	4,000	
145,901–164,200	82,101–92,400	52,501–59,100	37,901–42,700	23,301–26,300	4,250	
164,201–183,400	92,401–103,100	59,101–66,000	42,701–47,700	26,301–29,300	4,500	
183,401–203,700	103,101–114,600	66,001–73,300	47,701–53,000	29,301–32,600	4,750	
203,701–225,200	114,601–126,700	73,301–81,100	53,001–58,600	32,601–36,000	5,000	
225,201–247,700	126,701–139,400	81,101–89,200	58,601–65,400	36,001–39,600	5,250	
247,701–271,200	139,401–152,600	89,201–97,700	65,401–70,600	39,601–43,400	5,500	
271,201–295,900	152,601–166,500	97,701–106,500	70,601–77,000	43,401–47,400	5,750	
295,901–Greater	166,501–Greater	106,501–115,800	77,001–83,700	47,401–51,500	6,000	4
—	—	115,801–125,500	83,701–90,600	51,501–55,700	6,250	
—	—	125,501–135,500	90,601–97,900	55,701–60,200	6,500	
—	—	135,501–145,800	97,901–106,800	60,201–64,800	6,750	
—	—	145,801–156,700	106,801–113,200	64,801–69,600	7,000	
—	—	156,701–167,900	113,201–121,300	69,601–74,600	7,250	
—	—	167,901–179,400	121,301–129,600	74,601–79,800	7,500	
—	—	179,401–191,400	129,601–138,300	79,801–85,100	7,750	
—	—	191,401–Greater	138,301–Greater	85,101–Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.
a. Types of construction are based on the *International Building Code*.
b. Measured at 20 psi residual pressure.

507.3.4 Calculation Area. The *fire flow calculation area* shall be determined in accordance with Sections 507.3.4.1 through 507.3.4.3.

507.3.4.1 General. The *fire-flow calculation area* shall be the total floor area of all floor levels within the *exterior walls*, and under the horizontal projections of the roof of a building, except as modified in Section 507.3.4.3.

507.3.4.2 Area separation. Portions of buildings that which are separated by *fire walls* without openings, constructed in accordance with the *International Building Code*, are allowed to be considered as separate fire-flow calculation areas.

507.3.4.3 Type IA and Type IB construction. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.

Exception: Fire-flow calculation area for open parking garages shall be determined by the area of the largest floor.

SECTION 508
FIRE COMMAND CENTER

508.1.3 Size. The *fire command center* shall be not less than ~~0.015 percent of the total building area of the facility served or~~ 200 square feet (19 m^2) in area, ~~whichever is greater,~~ with a minimum dimension of ~~0.7 times the square root of the room area or~~ 10 feet (3048 mm)~~, whichever is greater~~.

~~Where a *fire command center* is required for Group F-1 and S-1 occupancies with a building footprint greater than 500,000 square feet (46 452 m^2), the *fire command center* shall have a minimum size of 96 square feet (9 m^2) with a minimum dimension of 8 feet (2438 mm) where *approved* by the *fire code official*.~~

SECTION 510
EMERGENCY RESPONDER COMMUNICATION COVERAGE

510.1 Emergency responder communication coverage in new buildings. *Approved* in-building, two-way emergency responder communication coverage for emergency responders shall be provided in all new buildings. In-building, two-way emergency responder communication coverage within the building shall be based on the existing coverage levels of the public safety communication systems utilized by the jurisdiction, measured at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained instead of an *approved* ~~radio~~ communication coverage system.
2. Where it is determined by the *fire code official* that the ~~radio~~ communication coverage system is not needed.
3. In facilities where emergency responder ~~radio~~ communication coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the *fire code official* shall have the authority to accept an automatically activated emergency responder ~~radio~~ communication coverage system.
4. New buildings 7,500 square feet or less and not more than 1 story above *grade plane*.

   4.1. This exception does not apply to windowless buildings, underground buildings or buildings with a *basement*.

510.2 Emergency responder communication coverage in existing buildings. Deleted. ~~Existing buildings shall be provided with *approved* in-building, two-way emergency responder communication coverage for emergency responders as required in Chapter 11.~~

510.4.2 System design. The in-building, two-way emergency responder communication coverage system shall be designed in accordance with Sections 510.4.2.1 through 510.4.2.8 and NFPA 122~~1~~5.

510.5 Installation requirements. The installation of the in-building, two-way emergency responder communication coverage system shall be in accordance with NFPA 122~~1~~5 and Sections 510.5.2 through 510.5.5.

510.5.2 Approval prior to installation. Amplification systems capable of operating on frequencies licensed to any public safety *agency* by the FCC or other radio licensing authority shall not be installed without prior coordination and approval of the *fire code official* and the frequency license holder(s).

510.5.4 Acceptance test procedure. Where an in-building, two-way emergency responder communication coverage system is required, and upon completion of installation, the building *owner* shall have the radio system tested to verify that two-way coverage on each floor of the building is not less than 95 percent. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas. Where a floor exceeds 128,000 ft2 (11,900 m2), which is the floor area that can be covered by the maximum grid dimension of 80 ft. (24.4m), the floor shall be subdivided into sectors each having an area less than or equal to 128,000 ft2 (11,900 m2), and each sector be tested individually with 20 grid cells in each sector. Signal strength measurements should be taken at the center of each grid and should be performed using standardized parameters as specified by NFPA 1221~~4~~5.
2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the *agency* talking through the *agency*'s radio communications system or equipment *approved* by the *fire code official*.
3. Failure of more than one test area shall result in failure of the test.
4. In the event that two of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of not more than two nonadjacent test areas shall not result in failure of the test. If the system fails the 40-area test, the system shall be altered to meet the 95-percent coverage requirement.
5. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public *agency*'s radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered to be a failure of that test area. Additional test locations shall not be permitted.
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building *owner* so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building *owner* shall be required to rerun the acceptance test to reestablish the gain values.
7. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and at subsequent annual inspections.
8. Systems shall be tested using two portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet (3048 mm) from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ levels as specified in Sections 510.4.1.1 and 510.4.1.2.

SECTION 511
1- AND 2-FAMILY DWELLING SUBDIVISIONS AND TOWNHOUSE DEVELOPMENTS

511.1 General. The provisions of the section shall be applicable to subdivisions with three or more one- and two-family *dwellings* and *townhouse* developments where the structures that are designed and constructed in accordance with the *International Residential Code*. This section provides requirements for premises identification, fire apparatus access roads and water supplies.

Exception: Those subdivisions not subject to the regulations authorized by GS 160D-802.

511.2 Fire flow. The minimum *fire-flow* and flow duration requirements for one- and two-family *dwellings* and *townhouses* shall be as specified in Tables 511.2(1) and 511.2(2) or ISO Guide for Determination of Needed Fire Flow.

511.2.1 Areas without water supply systems or with limited water supply systems. The fire code official is authorized to utilize NFPA 1142, the *International Wildland-Urban Interface Code* or other *approved* method for areas without water supply systems or those areas with mains less than 6 inches in diameter.

TABLE 511.2(1)
REQUIRED FIRE FLOW FOR ONE- AND TWO-FAMILY DWELLINGS AND TOWNHOUSES

FIRE-FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
0–3,600	No automatic sprinkler system	1,000	1

3,601 and greater	No automatic sprinkler system	Value in Table 511.2(2)	Duration in Table 511.2(2) at the required fire-flow rate
0–3,600	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	500	1/2
3,601 and greater	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	1/2 value in Table 511.2(2)	1

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m.

TABLE 511.2(2)
REFERENCE TABLE FOR TABLE 511.2(1)

FIRE-FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
0–22,700	0–12,700	0–8,200	0–5,900	0–3,600	1,500	2
22,701–30,200	12,701–17,000	8,201–10,900	5,901–7,900	3,601–4,800	1,750	
30,201–38,700	17,001–21,800	10,901–12,900	7,901–9,800	4,801–6,200	2,000	
38,701–48,300	21,801–24,200	12,901–17,400	9,801–12,600	6,201–7,700	2,250	
48,301–59,000	24,201–33,200	17,401–21,300	12,601–15,400	7,701–9,400	2,500	
59,001–70,900	33,201–39,700	21,301–25,500	15,401–18,400	9,401–11,300	2,750	
70,901–83,700	39,701–47,100	25,501–30,100	18,401–21,800	11,301–13,400	3,000	3
83,701–97,700	47,101–54,900	30,101–35,200	21,801–25,900	13,401–15,600	3,250	
97,701–112,700	54,901–63,400	35,201–40,600	25,901–29,300	15,601–18,000	3,500	
112,701–128,700	63,401–72,400	40,601–46,400	29,301–33,500	18,001–20,600	3,750	
128,701–145,900	72,401–82,100	46,401–52,500	33,501–37,900	20,601–23,300	4,000	4
145,901–164,200	82,101–92,400	52,501–59,100	37,901–42,700	23,301–26,300	4,250	
164,201–183,400	92,401–103,100	59,101–66,000	42,701–47,700	26,301–29,300	4,500	
183,401–203,700	103,101–114,600	66,001–73,300	47,701–53,000	29,301–32,600	4,750	
203,701–225,200	114,601–126,700	73,301–81,100	53,001–58,600	32,601–36,000	5,000	
225,201–247,700	126,701–139,400	81,101–89,200	58,601–65,400	36,001–39,600	5,250	
247,701–271,200	139,401–152,600	89,201–97,700	65,401–70,600	39,601–43,400	5,500	
271,201–295,900	152,601–166,500	97,701–106,500	70,601–77,000	43,401–47,400	5,750	
295,901–Greater	166,501–Greater	106,501–115,800	77,001–83,700	47,401–51,500	6,000	
—	—	115,801–125,500	83,701–90,600	51,501–55,700	6,250	
—	—	125,501–135,500	90,601–97,900	55,701–60,200	6,500	
—	—	135,501–145,800	97,901–106,800	60,201–64,800	6,750	

—	—	145,801–156,700	106,801–113,200	64,801–69,600	7,000	
—	—	156,701–167,900	113,201–121,300	69,601–74,600	7,250	
—	—	167,901–179,400	121,301–129,600	74,601–79,800	7,500	
—	—	179,401–191,400	129,601–138,300	79,801–85,100	7,750	
—	—	191,401–Greater	138,301–Greater	85,101–Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.
a. Types of construction are based on the *International Building Code*.
b. Measured at 20 psi residual pressure.

511.3 Fire apparatus access. Fire apparatus access roads for one- or two-family *dwelling* developments shall meet the design requirements as specified in Section 503 and shall comply with Sections 511.3.1 and 511.3.2.

511.3.1 One- or two-family dwelling residential developments. Developments of one- or two-family *dwellings* where the number of *dwelling units* exceeds 100 shall be provided with two separate and *approved* fire apparatus access roads.

Exception: Where there are more than 100 *dwelling units* accessed from a single public or private fire apparatus access road and all *dwelling units* are equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3 of the *International Fire Code*, access from two directions shall not be required.

511.3.2 Projects having more than 200 dwelling units. One- or two-family residential projects having more than 200 *dwelling units* shall be provided with two separate and *approved* fire apparatus access roads regardless of whether they are equipped with an *approved automatic sprinkler system*.

511.4 Premises identification. Buildings shall be provided with approved address identification as required by Section R319 of the *International Residential Code* and Section 106.4 of the North Carolina Administrative Code and Policies. Street and road signs shall comply with Section 505.2.

CHAPTER 6
BUILDING SERVICES AND SYSTEMS

~~**User note:**~~

~~***About this chapter:*** *Chapter 6 focuses on building systems and services as they relate to potential safety hazards and when and how they should be installed. This chapter brings together all building system- and service-related issues for convenience and provides a more systematic view of buildings. The following building services and systems are addressed: electrical equipment wiring and hazards, elevator operation, maintenance and fire service keys, fuel-fired appliances, commercial cooking equipment and systems, commercial cooking oil storage, mechanical refrigeration, hyperbaric facilities and clothes dryer exhaust systems. Note that building systems focused on energy systems and components are addressed by Chapter 12. Portions of this chapter were extensively reorganized for the 2021 edition. For clarity, the relocation marginal markings have not been included. For complete information, see the relocations table in the preface information of this code.*~~

SECTION 604
ELEVATOR OPERATION, MAINTENANCE AND FIRE SERVICE KEYS

604.2 Emergency operation. ~~Existing elevators with a travel distance of 25 feet (7620 mm) or more shall comply with the requirements in Chapter 11.~~ New elevators shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with ASME A17.1/CSA B44.

SECTION 605
FUEL-FIRED APPLIANCES

605.6.3 Special day care provisions. In adult and child day care facilities, masonry fireplaces, listed fuel-burning space heaters, fireplaces and floor furnaces that are provided with a protective screen attached securely with supports that will prevent accidental burning will be allowed. Unvented fuel-burning heaters and portable electric heaters with exposed heating elements are prohibited.

SECTION 606
COMMERCIAL COOKING EQUIPMENT AND SYSTEMS

[M] 606.2 Where required. A Type I hood shall be installed at or above all commercial cooking appliances and domestic cooking appliances used for commercial purposes that produce grease vapors.

Exceptions:

1. Factory-built commercial exhaust hoods that are *listed* and *labeled* in accordance with UL 710, and installed in accordance with Section 304.1 of the *International Mechanical Code*, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5 of the *International Mechanical Code*.
2. Factory-built commercial cooking recirculating systems that are *listed* and *labeled* in accordance with UL 710B, and installed in accordance with Section 304.1 of the *International Mechanical Code*, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5 of the *International Mechanical Code*. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1 of the *International Mechanical Code*. For the purpose of determining the floor area required to be ventilated, each individual appliance shall be considered as occupying not less than 100 square feet (9.3 m^2).
3. Where cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are *listed* and *labeled* for the application in accordance with NFPA 96, a hood shall not be required at or above them.
4. A Type I hood shall not be required for an electric cooking appliance where an *approved* testing agency provides documentation that the appliance effluent contains 5 mg/m^3 or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m^3/s) in accordance with UL 710B.
5. Domestic cooking appliances used for commercial purposes in accordance with Section 507.1.2 of the International Mechanical Code.

CHAPTER 7
FIRE AND SMOKE PROTECTION FEATURES

~~**User note:**~~

~~***About this chapter:** Chapter 7 provides requirements to maintain the fire-resistance ratings of building elements and to limit fire spread. Section 701 addresses the maintenance of and owner's responsibility for construction elements such as fire barriers and smoke barriers. The rest of the chapter deals with various aspects that also must be maintained to achieve overall fire resistance of the main fire- and smoke-resistive features. These include penetrations, joint protection, door and window openings, and duct and air transfer opening protection.*~~

SECTION 701
GENERAL

701.1 Scope. The provisions of this chapter shall govern the periodic inspection and maintenance of the materials, systems and assemblies used for structural *fire resistance*, *fire-resistance-rated* construction separation of adjacent spaces and construction installed to resist the passage of smoke to safeguard against the spread of fire and smoke within an existing building and the spread of fire to or from existing buildings. New buildings shall comply with the *International Building Code.*

SECTION 704
JOINTS AND VOIDS

704.1 Maintaining protection. ~~Where required when the building was originally constructed,~~ Materials and systems used to protect joints and voids in the following locations shall be maintained. The materials and systems shall be securely attached to or bonded to the adjacent construction, without openings visible through the construction.

1. Joints in or between *fire-resistance-rated* walls, floors or floor/ceiling assemblies and roof or roof/ceiling assemblies.
2. Joints in *smoke barriers*.
3. Voids at the intersection of a horizontal floor assembly and an exterior curtain wall.
4. Voids at the intersection of a horizontal *smoke barrier* and an exterior curtain wall.
5. Voids at the intersection of a nonfire-resistance-rated floor assembly and an exterior curtain wall.
6. Voids at the intersection of a vertical *fire barrier* and an exterior curtain wall.
7. Voids at the intersection of a vertical *fire barrier* and a nonfire-resistance-rated roof assembly.

Unprotected joints and voids do not need to be protected where such joints and voids were not required to be protected when the building was originally constructed. Where the system design number is known, the system shall be inspected to the listing criteria and manufacturer's installation instructions.

SECTION 705
DOOR AND WINDOW OPENINGS

705.1 General. ~~Where required when the building was originally constructed,~~ Opening protectives installed in *fire-resistance-rated* assemblies, *smoke barriers* and *smoke partitions* shall be inspected and maintained in accordance with this section.

705.2 Inspection and maintenance. *Opening protectives* in *fire-resistance-rated* assemblies shall be inspected and maintained in accordance with NFPA 80. *Opening protectives* in *smoke barriers* shall be inspected and maintained in accordance with NFPA 80 and NFPA 105. Openings in smoke partitions shall be inspected and maintained in accordance with NFPA 105. Fire doors and smoke and draft control doors shall not be blocked, obstructed, or otherwise made inoperable. Fusible links shall be replaced promptly whenever fused, painted, or damaged. *Opening protectives* and smoke and draft control doors shall not be modified.

[B] 705.2.7 Identification. Walls and partitions required to have protected openings (fire walls, fire barriers, fire partitions, smoke barriers, smoke partitions) shall be permanently identified with signs or stenciling. Such identification shall be:

1. Where there is an accessible concealed floor, floor-ceiling, or attic space.
2. Maintained in accordance with the code applicable at the time of construction.
3. Suggested wording: "2-HOUR FIRE BARRIER, PROTECT ALL OPENINGS."

SECTION 706
DUCT AND AIR TRANSFER OPENINGS

706.2 Unprotected openings. Unprotected duct and air transfer openings in *fire-resistance-rated* construction and construction installed to resist the passage of smoke shall be protected so as to comply with requirements that were in effect when the building was constructed, remodeled or altered.

SECTION 708
SPRAY FIRE-RESISTANT MATERIALS AND INTUMESCENT FIRE-RESISTANT MATERIALS

708.1 Maintaining protection. Where required when the building was ~~originally permitted and~~ constructed, remodeled, or altered, spray fire-resistant materials and intumescent fire-resistant materials shall be visually inspected to verify that the materials do not exhibit exposure to the substrate.

CHAPTER 8
INTERIOR FINISH, DECORATIVE MATERIALS AND FURNISHINGS

~~**User note:**~~

~~***About this chapter:*** Chapter 8 provides requirements for interior finishes, decorative materials and furnishings in new and existing buildings so that they do not significantly add to or create fire hazards in buildings. The provisions tend to focus on occupancies with specific risk characteristics, such as vulnerability of occupants, density of occupants, lack of familiarity with the building and societal expectations of importance. This chapter is consistent with Chapter 8 of the International Building Code®, which regulates the interior finishes and decorative materials of new buildings.~~

SECTION 805
UPHOLSTERED FURNITURE AND MATTRESSES IN NEW AND EXISTING BUILDINGS

805.2 Group I-2 and Group B ambulatory care facilities. The requirements in Sections 805.2.1 through 805.2.2 shall apply to ~~facilities~~ Group I-2 occupancies and Group B ambulatory care facilities.

808.4 Combustible lockers or cubbies. Where lockers or cubbies constructed of combustible materials are used, they ~~lockers~~ shall be considered to be interior finish and shall comply with Section 803.

Exception: Lockers or cubbies constructed entirely of wood and noncombustible materials shall be permitted to be used wherever interior finish materials are required to meet a Class C classification in accordance with Section 803.1.2.

CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY SYSTEMS

~~**User note:**~~

~~***About this chapter:*** *Chapter 9 prescribes the minimum requirements for active fire protection equipment systems to perform the functions of detecting a fire, alerting the occupants or fire department of a fire emergency, mass notification, gas detection, controlling smoke and controlling or extinguishing the fire. Generally, the requirements are based on the occupancy, the height and the area of the building because these are the factors that most affect fire-fighting capabilities and the relative hazard of a specific building or portion thereof. This chapter parallels and is substantially duplicated in Chapter 9 of the* International Building Code®*; however, this chapter also contains periodic testing criteria that are not contained in the* International Building Code*. In addition, the special fire protection system requirements based on use and occupancy found in Chapter 4 of the* International Building Code *are duplicated in this chapter as a user convenience.*~~

SECTION 901
GENERAL

~~**901.1 Scope.** The provisions of this chapter shall specify where *fire protection* and *life safety systems* are required and shall apply to the design, installation, inspection, operation, testing and maintenance of all *fire protection* and *life safety systems*.~~ The provisions of the *International Building Code* shall specify where *fire protection* and *life safety systems* are required. The provisions of *the International Fire Code* shall determine the design, installation, inspection, operation, testing and maintenance of all *fire protection and life safety systems*.

901.2.2 Shop drawings. Shop drawings for fire protection and life safety systems shall be prepared in accordance with Table 901.2.2 and submitted for review and approval prior to installation.

Table 901.2.2

Standards for Shop Drawings

Automatic sprinkler systems	**NFPA 13, NFPA 13R, NFPA 13D, NFPA 22**
Wet-chemical systems	**NFPA 17A**
Dry-Chemical systems	**NFPA 12**

Foam systems	**NFPA 11 and NFPA 16**
Carbon dioxide systems	**NFPA 12**
Halon systems	**NFPA 12A**
Clean agent systems	**NFPA 2001**
Automatic water mist systems	**NFPA 750**
Aerosol fire-extinguishing systems	**NFPA 2010**
Standpipe systems	**NFPA 14**
Fire alarm and detection systems	**NFPA 72**
Fire pumps	**NFPA 20**
Smoke control systems	**NFPA 92**
Carbon monoxide detection systems	**NFPA 720**

901.4.1 Required fire protection and life safety systems. *Fire protection* and *life safety systems* required by this code or the *International Building Code* shall be installed, repaired, operated, tested and maintained in accordance with this code. A *fire protection* or *life safety system* for which a design option, exception or reduction to the provisions of this code or the *International Building Code* or the *International Existing Building Code* has been granted shall be considered to be a required system.

901.4.2 Nonrequired fire protection and life safety systems. *Fire protection* and *life safety systems* or portion thereof not required by this code or the *International Building Code* or the *International Existing Building Code* shall be allowed to be furnished for partial or complete protection provided that such installed systems meet the applicable requirements of this code and the *International Building Code*.

901.4.3 Alterations in buildings and structures. For any *alteration* within a building or structure, the *fire protection* and *life safety systems* shall be extended, altered or augmented to maintain and continue protection within the building or structure. Persons shall not remove or modify any *fire protection* or life safety system installed or maintained under the provisions of this code or the *International Building Code* without approval from the *fire code official* *and building code official.*

901.4.4 Fire areas. Where buildings, or portions thereof, are divided into *fire areas* so as not to exceed the limits established for requiring a *fire protection system* in accordance with this chapter, such *fire areas* shall be separated by *fire walls* constructed in accordance with Section 706 of the *International Building Code*, *fire barriers* constructed in accordance with Section 707 of the *International Building Code* or *horizontal assemblies* constructed in accordance with Section 711 of the *International Building Code*, or both, having a *fire-resistance rating* of not less than that determined in accordance with Section 707.3.10 of the *International Building Code*.

901.4.5 Additional fire protection systems. In occupancies ~~of a hazardous nature,~~ where special hazards are identified by the code official, ~~exist~~ in addition to the ~~normal~~ common hazards of the occupancy, or where fire apparatus access does not comply with section 503,the *building official* and *fire code official* ~~determines that access for fire apparatus is unduly difficult, the *fire code official*~~ shall have the authority to require additional safeguards, ~~and~~ *fire protection systems* and *life safety systems* be installed in accordance with this code and the applicable referenced standards. ~~*Fire protection* and *life safety systems* required under this section shall be installed in accordance with this code and the applicable referenced standards.~~

901.4.8 Hose threads. Threads provided for the fire department connections to sprinkler systems, standpipes, yard hydrants or any other fire hose connection shall be compatible with the connections used by the local fire department.

901.6 Inspection, testing and maintenance. *Fire protection* and *life safety systems* shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective. Nonrequired *fire protection* and *life safety systems* and equipment shall be inspected, tested and maintained or the exposed components of such systems shall be removed in accordance with Section 901.8.

901.6.1 Standards. *Fire protection systems* shall be inspected, tested and maintained in accordance with the referenced standards *listed* in Table 901.6.1.

SECTION 902
DEFINITIONS

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

NIGHTCLUB.

SECTION 903
AUTOMATIC SPRINKLER SYSTEMS

903.2.1 Group A. An *automatic sprinkler system* shall be provided throughout buildings and portions thereof used as Group A occupancies as provided in this section. For Group A-1, A-2, A-3 and A-4 occupancies, the *automatic sprinkler system* shall be provided throughout the *fire area* containing the Group A-1, A-2, A-3 or A-4 occupancy and any fire area traversed to the entrance of an exit, and throughout all stories from the Group A occupancy to, and including, the *levels of exit discharge* serving the Group A occupancy. For Group A-5 occupancies, the *automatic sprinkler system* shall be provided in the spaces indicated in Section 903.2.1.5.

903.2.1.1 Group A-1. An *automatic sprinkler system* shall be provided throughout ~~stories containing~~ Group A-1 occupancies ~~and throughout all stories from the Group A-1 occupancy to and including the *levels of exit discharge* serving that occupancy~~ where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.
4. The *fire area* contains a multiple-theater complex.

903.2.1.2 Group A-2. An *automatic sprinkler system* shall be provided throughout ~~stories containing~~ Group A-2 occupancies ~~and throughout all stories from the Group A-2 occupancy to and including the *levels of exit discharge* serving that occupancy~~ where one of the following conditions exists:

1. The *fire area* exceeds 5,000 square feet (464 m^2).
2. The *fire area* has an *occupant load* of 300 or more, except 100 or more for nightclubs.
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

903.2.1.3 Group A-3. An *automatic sprinkler system* shall be provided throughout ~~stories containing~~ Group A-3 occupancies ~~and throughout all stories from the Group A-3 occupancy to and including the *levels of exit discharge* serving that occupancy~~ where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.

   Exceptions:

   1.1. This requirement shall not apply to assembly occupancies used primarily for worship, with fixed seating and part of a separated use.

   1.2. This requirement shall not apply to assembly occupancies used primarily for worship consisting of a single multipurpose room that are not used for exhibition or display and are part of a separated use.
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

903.2.1.4 Group A-4. An *automatic sprinkler system* shall be provided throughout ~~stories containing~~ Group A-4 occupancies ~~and throughout all stories from the Group A-4 occupancy to and including the *levels of exit discharge* serving that occupancy~~ where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

903.2.1.6 Assembly occupancies on roofs. Where an occupied roof has an assembly occupancy with an *occupant load* exceeding 100 for Group A-2 nightclubs and 300 for other Group A occupancies, all floors between the occupied roof and the *level of exit discharge* shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

Exception: Open parking garages of Type I or Type II construction.

903.2.2 Ambulatory care facilities. An *automatic sprinkler system* shall be installed throughout *fire area* ~~the entire floor~~ containing an *ambulatory care facility* where either of the following conditions exist at any time:

1. Four or more care recipients are incapable of self-preservation.
2. One or more care recipients that are incapable of self-preservation are located at other than the *level of exit discharge* serving such a facility.

In buildings where ambulatory care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* shall be installed throughout the fire area containing an *ambulatory care facility* ~~entire floor~~ and any *fire area* traversed to the entrance of an exit as well as all floors below where such care is provided, and all floors between the level of ambulatory care and the nearest *level of exit discharge*, the *level of exit discharge*, and all floors below the *level of exit discharge*.

Exception: Floors classified as an open parking garage are not required to be sprinklered.

903.2.3 Group E. An *automatic sprinkler system* shall be provided for Group E occupancies as follows:

1. Throughout all Group E *fire areas* greater than 12,000 square feet (1115 m^2) in area.
2. ~~The Group E *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.~~

   Throughout Group E fire areas located on a floor other than the level of exit discharge and any fire areas traversed to the entrance of an exit, and throughout stories from the Group E occupancy to, and including, the nearest level of exit discharge.

   Exception: In buildings where every classroom has not fewer than one exterior exit door at ground level, an *automatic sprinkler system* is not required in any area below the lowest *level of exit discharge* serving that area.
3. The Group E *fire area* has an *occupant load* of 300 or more.

903.2.4.1 Woodworking operations. Deleted - see 903.2.11.7 ~~An *automatic sprinkler system* shall be provided throughout all Group F-1 occupancy *fire areas* that contain woodworking operations in excess of 2,500 square feet (232 m^2) in area that generate finely divided combustible waste or use finely divided combustible materials.~~

903.2.4.3 Group F-1 upholstered furniture or mattresses. Deleted – see 903.2.11.8. ~~An *automatic sprinkler system* shall be provided throughout a Group F-1 *fire area* that exceeds 2,500 square feet (232 m^2) used for the manufacture of upholstered furniture or mattresses.~~

903.2.6.1 Dry pipe system. When dry-pipe sprinkler systems are installed, upon activation a full flow of water shall be delivered to the most remote point of the system in no more than 60 seconds.

903.2.8 Group R. An *automatic sprinkler system* installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R *fire area*, except as provided for in Section 903.2.8.5 and 903.2.8.6.

Exceptions:

1. An *automatic sprinkler system* is not required in new adult and child day care facilities located in existing Group R-3 and R-4 occupancies.
2. An *automatic sprinkler system* is not required in *temporary overflow shelters*.
3. An *automatic sprinkler system* is not required in camping units located within a campground where all of the following conditions exist.
   3.1. The camping unit is limited to one story in height.
   3.2. The camping unit is less than 400 square feet (37 m_2) in area.
   3.3. The camping unit does not have a kitchen.

4. An *automatic sprinkler system* is not required in an *open-air camp cabin* that complies with the following:
   4.1. The *open-air camp cabin* shall have at least two remote unimpeded exits. Lighted exit signs shall not be required.
   4.2. The *open-air camp cabin* shall not be required to have plumbing or electrical systems, but if the cabin has these systems, then the provisions of the code otherwise applicable to those systems shall apply.
   4.3. Smoke alarms and portable fire extinguishers shall be installed as required by other sections of this code.

5. Temporary sleeping units for disaster relief workers as allowed by Section 324.4.5.

903.2.8.1 Group R-3. An *automatic sprinkler system* installed in accordance with Section 903.3.1.3 shall be permitted in Group R-3 occupancies.

Exception: An *automatic sprinkler system* installed in accordance with Section 903.3.1.1 shall be installed in all licensed respite care facilities.

903.2.8.2 Group R-4, Condition 1. An *automatic sprinkler system* installed in accordance with Section 903.3.1.3 shall be permitted in Group R-4, Condition 1 occupancies.

Exception: An *automatic sprinkler system* installed in accordance with Section 903.3.1.1 shall be installed in all licensed respite care facilities.

903.2.8.3 Group R-4, Condition 2. An *automatic sprinkler system* installed in accordance with Section 903.3.1.2 shall be permitted in Group R-4, Condition 2 occupancies.

Exception: An *automatic sprinkler system* installed in accordance with Section 903.3.1.1 shall be installed in all licensed respite care facilities.

903.2.8.4 Care facilities. Deleted ~~An *automatic sprinkler system* installed in accordance with Section 903.3.1.3 shall be permitted in care facilities with five or fewer individuals in a single-family *dwelling*.~~

[F]903.2.8.5 Group R Migrant Housing. Group R-2 buildings housing farm workers and their families located outside of a municipality's building rules jurisdiction may install a 13D multipurpose sprinkler system where all of the following conditions exist:

1. The building shall not exceed two stories in height;

2. The building shall not exceed 2500 square feet (232 m^2) in area; and

3. The building shall have two remote means of egress.

903.2.8.5.1 Group R Migrant Housing. Migrant housing as defined by N.C.G.S. 95-223 shall be exempt when all of the following conditions exist:

1. The building is not more than one story in height.

2. The building meets all of the requirements of N.C.G.S. 95-222 through N.C.G.S. 95-229.1 (Chapter 95, Article 19) and 29 CFR 1910.142, as amended.

903.2.8.6 Emergency service sleeping area. Group R~~-2~~ *fire areas* in fire or emergency medical service buildings ~~fire stations~~ may install a ~~13D~~ sprinkler system in accordance with Sections 903.3.1.3 and 903.3.5.1 when separated from other occupancies by a *fire wall* where all of the following conditions exist.

1. The building shall not exceed one story in height,

2. The fire area shall not exceed 2500 square feet (232 m^2) in area.

3. The fire area has two remote means of egress.

903.2.9.4 Group S-1 upholstered furniture and mattresses. An *automatic sprinkler system* shall be provided throughout a Group S-1 *fire area* where the area used for the storage of upholstered furniture or mattresses exceeds 2,500 square feet (232 m^2).

Exception: Self-service storage facilities not greater than one story above grade plane. ~~where all storage spaces can be accessed directly from the exterior.~~

903.2.10 Group S-2 parking garages. An *automatic sprinkler system* shall be provided throughout buildings classified as parking garages where any of the following conditions exist:

1. Where the *fire area* of the enclosed parking garage, in accordance with Section 406.6 of the *International Building Code*, exceeds 12,000 square feet (1115 m^2).
2. Where the enclosed parking garage, in accordance with Section 406.6 of the *International Building Code*, is located beneath other groups.

   Exception: Enclosed parking garages located beneath Group R-3 occupancies.
3. Where the *fire area* of the open parking garage, in accordance with Section 406.5 of the *International Building Code*, exceeds 48,000 square feet (4460 m^2).

   Exception: Open parking garages of Type I-A construction.

903.2.11.7 Woodworking operations. An automatic sprinkler system shall be provided throughout fire areas that contain woodworking operations in excess of 2,500 square feet (232 m2) in area that generate finely divided combustible waste or use finely divided combustible materials.

903.2.11.8 Manufacture of upholstered furniture or mattresses. An automatic sprinkler system shall be provided throughout fire areas that contain manufacturing operations for upholstered furniture or mattresses in excess of 2,500 square feet (232 m2) in area.

TABLE 903.2.11.6
ADDITIONAL REQUIRED FIRE PROTECTION SYSTEMS

SECTION	SUBJECT
903.2.10.2	Mechanical-access enclosed parking garages
914.2.1	Covered and open mall buildings
914.3.1	High-rise buildings
914.4.1	Atriums
914.5.1	Underground structures
914.6.1	Stages
914.7.1	Special amusement buildings
914.8.2	Airport traffic control towers
914.8.3, 914.8.6	Aircraft hangars
914.9	Flammable finishes
914.10	Drying rooms
914.11.1	Ambulatory care facilities
1030.6.2.3	Smoke-protected assembly seating
~~1103.5.1~~	~~Existing Group A occupancies~~

~~1103.5.2~~	~~Pyroxylin plastic storage in existing buildings~~
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~~1103.5.5~~	~~Pyroxylin plastics~~
Table 1207.7, Table 1207.8, Table 1206.9, Table 1206.10	Stationary and mobile energy storage systems
2108.2	Dry cleaning plants
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2309.3.1.5.2	Hydrogen motor fuel-dispensing area canopies
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2404.4	Spray booths and spray rooms
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2405.4.1	Dip tanks
2405.9.4	Hardening and tempering tanks
2703.10	HPM facilities
2703.10.1.1	HPM work station exhaust
2703.10.2	HPM gas cabinets and exhausted enclosures
2703.10.3	HPM exit access corridor
2703.10.4	HPM exhaust ducts
2703.10.4.1	HPM noncombustible ducts
2703.10.4.2	HPM combustible ducts
2807.3	Lumber production conveyor enclosures
2808.7	Recycling facility conveyor enclosures
3006.1	Class A and B ovens
3006.2	Class C and D ovens
Table 3206.2	Storage fire protection
3206.4	Storage
3210.1.1	Record storage over 12 feet

(continued)

TABLE 903.2.11.6—continued
ADDITIONAL REQUIRED FIRE PROTECTION SYSTEMS

SECTION	SUBJECT

3704.5	Storage of more than 1,000 cubic feet of loose combustible fibers
5003.8.4.1	Gas rooms
5003.8.5.3	Exhausted enclosures
5004.5	Indoor storage of hazardous materials
5005.1.8	Indoor dispensing of hazardous materials
5104.4.1	Aerosol product warehouses
5106.3.2	Aerosol display and merchandising areas
5306.2.1	Exterior medical gas storage room
5306.2.2	Interior medical gas storage room
5306.2.3	Medical gas storage cabinet
5606.5.2.1	Storage of smokeless propellant
5606.5.2.3	Storage of small arms primers
5704.3.7.5.1	Flammable and combustible liquid storage rooms
5704.3.8.4	Flammable and combustible liquid storage warehouses
5705.3.7.3	Flammable and combustible liquid Group H-2 or H-3 areas
6004.1.2	Gas cabinets for highly toxic and toxic gas
6004.1.3	Exhausted enclosures for highly toxic and toxic gas
6004.2.2.6	Gas rooms for highly toxic and toxic gas
6004.3.3	Outdoor storage for highly toxic and toxic gas
6504.1.1	Pyroxylin plastic storage cabinets
6504.1.3	Pyroxylin plastic storage vaults
6504.2	Pyroxylin plastic storage and manufacturing

For SI: 1 cubic foot = 0.023 m^3.

903.3.1.2 NFPA 13R sprinkler systems. *Automatic sprinkler systems* in Group R occupancies shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or less above grade plane.

~~2. The floor level of the highest story is 30 feet (9144 mm) or less above the lowest level of fire department vehicle access.~~

~~3. The floor level of the lowest story is 30 feet (9144 mm) or less below the lowest level of fire department vehicle access.~~

Exception: Respite care facilities shall be provided with a NFPA 13 sprinkler system complying with Section 903.3.1.1.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 of the *International Building Code* shall be measured from *grade plane*.

903.3.1.2.2 Corridors and balconies in the means of egress. Sprinkler protection shall be provided in *corridors* and for balconies in the *means of egress* where any of the following conditions apply:

1. *Corridors* with combustible finishes. ~~floor or walls.~~
2. *Corridors* with an interior change of direction exceeding 45 degrees (0.79 rad).
3. *Corridors* that are less than 50 percent open to the outside atmosphere at the ends.
4. Open-ended *corridors* and associated exterior *stairways* and ramps as specified in Section 1027.6, Exception 3.
5. Egress balconies not complying with Sections 1021.2 and 1021.3.

903.3.1.2.3 Attics. Attic protection shall be provided as follows:

1. Attics that are used or intended for ~~living purposes or~~ storage shall be protected by an *automatic sprinkler system*.
2. Where fuel-fired equipment is installed in an unsprinklered attic, not fewer than one quick-response intermediate temperature sprinkler shall be installed above the equipment.
3. Where located in a building of Type III, Type IV or Type V construction designed in accordance with Section 510.2 or 510.4 of the *International Building Code*, attics not required by Item 1 to have sprinklers shall comply with one of the following if the roof assembly is located more than 55 feet (16 764 mm) above the lowest level of fire department vehicle access needed to meet the provisions in Section 503:
   3.1. Provide *automatic sprinkler system* protection.
   3.2. Construct the attic using noncombustible materials.
   3.3. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the *International Building Code*.
   3.4. Fill the attic with noncombustible insulation.

   The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance. For the purpose of this measurement, required fire vehicle access roads shall include only those roads that are necessary for compliance with Section 503.
4. Group R-4, Condition 2 occupancy attics not required by Item 1 to have sprinklers shall comply with one of the following:
   4.1. Provide *automatic sprinkler system* protection.
   4.2. Provide a heat detection system throughout the attic that is arranged to activate the building fire alarm system.
   4.3. Construct the attic using noncombustible materials.
   4.4. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the *International Building Code*.
   4.5. Fill the attic with noncombustible insulation.

903.3.1.3 NFPA 13D sprinkler systems. *Automatic sprinkler systems* installed in one- and two-family *dwellings*; Group R-3; Group R-4, Condition 1; and *townhouses* shall be permitted to be installed throughout in accordance with NFPA 13D or Section P2904 of the *International Residential Code*.

Exception: Respite care facilities shall be provided with a NFPA 13 sprinkler system complying with Section 903.3.1.1.

SECTION 904
ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS

904.1.1 Certification of service personnel for fire-extinguishing equipment. Deleted. ~~Service personnel providing or conducting maintenance on automatic fire-extinguishing systems, other than *automatic sprinkler systems*, shall possess a valid certificate issued by an *approved* governmental agency, or other *approved* organization for the type of system and work performed.~~

904.13.1 Manual system operation. ~~A manual actuation device shall be located at or near a *means of egress* from the cooking area not less than 10 feet (3048 mm).~~ At least one readily accessible means for manual actuation shall be located in the path of egress or at a location *approved* by the *fire code official* and not more than 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) nor less than 42 inches (1067 mm) above the floor and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

Exception: *Automatic sprinkler systems* shall not be required to be equipped with manual actuation means.

SECTION 905
STANDPIPE SYSTEMS

905.3.8 Landscaped roofs. Buildings or structures that have landscaped roofs in accordance with Section 317 and that are equipped with a standpipe system shall have the standpipe system extended to the roof level on which the landscaped roof is located.

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 *interior exit stairway* and required *exterior exit stairway*, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise *approved* by the *fire code official*.

   Exception: A single hose connection shall be permitted to be installed in the open *corridor* or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

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 an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the horizontal *exit*.

3. In every *exit passageway*, at the entrance from the *exit passageway* to other areas of a building.

   Exception: Where floor areas adjacent to an *exit passageway* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit passageway* to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall. 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 4 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 an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.

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.

905.12 Existing buildings. Deleted. ~~Where required in Chapter 11, existing structures shall be equipped with standpipes installed in accordance with Section 905.~~

SECTION 906
PORTABLE FIRE EXTINGUISHERS

906.1 Where required. Portable fire extinguishers shall be installed in all of the following locations:

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.

   Exceptions:

   1. In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each dwelling unit is provided with a portable fire extinguisher having a minimum rating of 1-A:10-B:C.
   2. In Group E occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each classroom is provided with a portable fire extinguisher having a minimum rating of 2-A:20-B:C.
   3. In storage areas of Group S occupancies where forklift, powered industrial truck or powered cart operators are the primary occupants, fixed extinguishers, as specified in NFPA 10, shall not be required where in accordance with all of the following:
      3.1. Use of vehicle-mounted extinguishers shall be *approved* by the *fire code official*.
      3.2. Each vehicle shall be equipped with a 10-pound, ~~4~~0A:80B:C extinguisher affixed to the vehicle using a mounting bracket *approved* by the extinguisher manufacturer or the *fire code official* for vehicular use.
      3.3. Not less than two spare extinguishers of equal or greater rating shall be available on-site to replace a discharged extinguisher.
      3.4. Vehicle operators shall be trained in the proper operation, use and inspection of extinguishers.
      3.5. Inspections of vehicle-mounted extinguishers shall be performed daily.
2. Within 30 feet (9144 mm) distance of travel from commercial cooking equipment and from domestic cooking equipment in Group I-1; I-2, Condition 2 ~~1~~; and R-2 college dormitory occupancies.
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 3316.1.
5. Where required by the sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the *fire code official*.

SECTION 907
FIRE ALARM AND DETECTION SYSTEMS

907.1.2 Fire alarm shop drawings. See Section 901.2.2. ~~Shop drawings for fire alarm systems shall be prepared in accordance with NFPA 72 and submitted for review and approval prior to system installation.~~

907.2 Where required—new buildings and structures. An *approved* fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.23 and provide occupant notification in accordance with Section 907.5, unless other requirements are provided by another section of this code.

A minimum of ~~Not fewer than~~ one manual fire alarm box shall be provided in an *approved* location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed when a manual fire alarm system is required.

Exceptions:

1. The manual fire alarm box is not required for fire alarm systems dedicated to elevator recall control and supervisory service.
2. The manual fire alarm box is not required for Group R-2 occupancies unless required by the *fire code official* to provide a means for fire watch personnel to initiate an alarm during a sprinkler system impairment event. Where provided, the manual fire alarm box shall not be located in an area that is open to the public.

907.2.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the *occupant load* due to the assembly occupancy is 300 or more, or where the Group A *occupant load* is more than 100 persons above or below the nearest ~~lowest~~ *level of exit discharge*. Group A occupancies not separated from one another in accordance with Section 707.3.10 and 711.2.4 of the *International Building Code* shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

907.2.3 Group E. A manual fire alarm system that initiates the occupant notification signal utilizing an emergency voice/alarm communication system meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall be installed in Group E occupancies. Where *automatic sprinkler systems* or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

Exceptions:

1. In other than licensed day care centers complying with Section 431 of the *International Building Code*, a manual fire alarm system shall not be required in Group E occupancies with an *occupant load* of 50 or less.
2. Emergency voice/alarm communication systems meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall not be required in Group E occupancies with occupant loads of 100 or less, provided that activation of the manual fire alarm system initiates an *approved* occupant notification signal in accordance with Section 907.5.
3. *Manual fire alarm boxes* shall not be required in Group E occupancies where all of the following apply:
    3.1. Interior *corridors* are protected by smoke detectors.
    3.2. Auditoriums, cafeterias, gymnasiums and similar areas are protected by *heat detectors* or other *approved* detection devices.
    3.3. Shops and laboratories involving dusts or vapors are protected by *heat detectors* or other *approved* detection devices.
    3.4. Manual activation is provided from a normally occupied location.
4. Manual fire alarm boxes shall not be required in Group E occupancies where all of the following apply:
    4.1. The building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1.
    4.2. The emergency voice/alarm communication system will activate on sprinkler water flow.
    4.3. Manual activation is provided from a normally occupied location.

907.2.9.3 Group R-2 college and university buildings. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-2 occupancies operated by a college or university for student or staff housing in all of the following locations:

1. Common spaces outside of *dwelling units* and *sleeping units*.
2. Laundry rooms, mechanical equipment rooms and storage rooms.

3. All interior *corridors* serving *sleeping units* or *dwelling units*.

907.2.10 Group S. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group S ~~public and self-storage occupancies~~ *self-service storage facilities* three stories or greater in height for interior *corridors* and interior common areas. Visible notification appliances are not required within storage units.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1, and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

907.2.23 Energy storage systems. An automatic smoke detection system or radiant-energy detection system shall be installed in rooms, areas and walk-in units containing energy storage systems as required in Section 1207.5.4.

907.2.24 Adult and child day care in Group R-4. A manual fire alarm system approved by the *licensing agency* ~~]~~ ~~listed for residential use~~ shall be installed in new adult or child day care facilities in existing R-4 occupancies.

907.5.2.1 Audible alarms. Audible alarm notification appliances shall be provided and emit a distinctive sound that is not to be used for any purpose other than that of a fire alarm.

Exceptions:

1. Audible alarm notification appliances are not required in critical care areas of Group I-2, Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.
2. A visible alarm notification appliance installed in a nurses' control station or other continuously attended staff location in a Group I-2, Condition 2 suite shall be an acceptable alternative to the installation of audible alarm notification appliances throughout a suite or unit in Group I-2, Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.
3. Where provided, audible notification appliances located in each enclosed occupant evacuation elevator lobby in accordance with Section 3008.9.1 of the *International Building Code* shall be connected to a separate notification zone for manual paging only.
4. In Group I-2 occupancies, Group B ambulatory health care facilities and licensed large residential care facilities, as in accordance with Section 430.5 of the *North Carolina Building Code* where occupants are incapable of evacuating themselves because of age, physical or mental disabilities, or physical restraint, audible notification appliances shall be permitted to meet the private mode requirements of NFPA 72 in patient care and treatment areas.

907.5.2.3.3.1 Wired equipment. Where wired equipment is used to comply with the future capability required by Section 907.5.2.3.3, the system shall include one of the following capabilities:

1. The replacement of audible appliances with combination audible/visible appliances or additional visible notification appliances.
2. The future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.
3. For wired equipment, the fire alarm power supply and circuits shall have not less than 5-percent excess capacity to accommodate the future addition of visible alarm notification appliances, and a single access point to such circuits shall be available on every story. Such circuits shall not be required to be extended beyond a single access point on a story. The fire alarm system shop drawings required by Section ~~907.1.2~~ 901.2.2 shall include the power supply and circuit documentation to accommodate the future addition of visible notification appliances.

907.9 Where required in existing buildings and structures. Deleted ~~An *approved* fire alarm system shall be provided in existing buildings and structures where required in Chapter 11.~~

SECTION 909
SMOKE CONTROL SYSTEMS

909.4 Analysis. A rational analysis performed by the registered design professional and *approved* by the *fire code official* supporting the types of smoke control systems to be employed, the methods of their operations, the systems supporting them and the methods of construction to be utilized shall accompany the *construction documents* submission and include, but not be limited to, the items indicated in Sections 909.4.1 through 909.4.7.

909.22.7 Manual smoke removal. Where manually operated panels or windows are required by Section 403.4.7 of the *North Carolina Building Code*, they shall be maintained in an operable condition and identified in an *approved* manner.

SECTION 910
SMOKE AND HEAT REMOVAL

910.5.1 Smoke and heat vents. Smoke and heat vents shall be maintained in an operative condition. Inspection, testing and maintenance shall be in accordance with NFPA 204, except ~~as follows:~~ fused, damaged or painted fusible links shall be replaced.

~~1. Mechanically operated smoke and heat vents shall be inspected annually and operationally tested not less than every 5 years.~~

~~2. Gravity dropout smoke and heat vents shall be inspected annually.~~

~~3. Fused, damaged or painted fusible links shall be replaced.~~

910.5.2 Mechanical smoke removal systems. Mechanical smoke removal systems shall be maintained in an operative condition. Inspection, testing and maintenance shall be in accordance with NFPA 204 and the equipment manufacturer's instructions. ~~except as follows:~~

~~1. Systems shall be inspected and operationally tested annually.~~

~~2. Testing shall include the operation of all system components, controls and ancillary equipment, such as makeup air openings.~~

~~3. A written schedule for routine maintenance and operational testing shall be established and testing shall be conducted in accordance with the schedule.~~

SECTION 911
EXPLOSION CONTROL

911.6 Liquefied petroleum gas distribution facilities. Liquefied petroleum gas distribution facilities shall comply with Chapter 119, Article 5 of the General Statutes of North Carolina, and the 02 NCAC 38, Section .0700, as enforced by the North Carolina Department of Agriculture and Consumer Services through the provisions of NFPA 58.

SECTION 915
CARBON MONOXIDE DETECTION

915.1 General. Carbon monoxide detection shall be installed in new buildings in accordance with Sections 915.1.1 through 915.6. Carbon monoxide detection shall be installed in existing buildings in accordance with NCGS 143-138(b2) and applicable sections of the *International Existing Building Code*. ~~Section 1103.9~~.

915.1.1 Where required. Carbon monoxide detection shall be provided in Group A-2, I, ~~I-1, I-2, I-4~~ and R occupancies and in classrooms in Group E occupancies in the locations specified in Section 915.2 where any of the conditions in Sections 915.1.2 through 915.1.6 exist.

915.1.2 Fuel-burning appliances and fuel-burning fireplaces. Carbon monoxide detection shall be provided in Group A-2 occupancies, *dwelling units*, *sleeping units* and classrooms that contain a fuel-burning appliance or a fuel-burning fireplace.

915.1.3 Fuel-burning forced-air furnaces. Carbon monoxide detection shall be provided in Group A-2 occupancies, *dwelling units*, *sleeping units* and classrooms served by a fuel-burning, forced-air furnace.

Exception: Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms where a carbon monoxide detector is provided in the first room or area served by each main duct leaving the furnace, and the carbon monoxide alarm signals are automatically transmitted to an *approved* location.

915.2 Locations. Where required by Section 915.1.1, carbon monoxide detection shall be installed in the locations specified in Sections 915.2.1 through 915.2.3.

915.2.1 Dwelling units. Carbon monoxide detection shall be installed in *dwelling units* outside of each separate sleeping area in the immediate vicinity of the bedrooms. Where a fuel-burning appliance is located within a bedroom or its attached bathroom, carbon monoxide detection shall be installed within the bedroom.

915.2.2 Sleeping units. Carbon monoxide detection shall be installed in *sleeping units*.

Exceptions:

1. Carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area in the immediate vicinity of the *sleeping unit* where the *sleeping unit* or its attached bathroom does not contain a fuel-burning appliance and is not served by a forced-air furnace.
2. In Group I-3, carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area in the immediate vicinity of the *sleeping unit.*

915.4.1 Power source. Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than that required for overcurrent protection.

Exceptions:

1. Where installed in buildings without commercial power, battery-powered carbon monoxide alarms shall be an acceptable alternative.

2. In A-2 occupancies the carbon monoxide detector shall be permitted to be battery-powered.

915.5.1 General. Carbon monoxide detection systems shall comply with NFPA 720. Carbon monoxide detectors shall be *listed* in accordance with UL 2075.

915.5.2 Locations. Carbon monoxide detectors shall be installed in the locations specified in Section 915.2. These locations supersede the locations specified in NFPA 720.

915.6 Maintenance. Carbon monoxide alarms and carbon monoxide detection systems shall be maintained in accordance with NFPA 720. Carbon monoxide alarms and carbon monoxide detectors that become inoperable or begin producing end-of-life signals shall be replaced.

SECTION 917
MASS NOTIFICATION SYSTEMS

917.1 College and university campuses. Prior to construction of a new building requiring a fire alarm system on a multiple-building college or university campus having a cumulative building *occupant load* of 1,000 or more, a *registered design professional* shall conduct a mass notification risk analysis ~~shall be conducted~~ in accordance with NFPA 72. Where the risk analysis determines a need for mass notification, an *approved* mass notification system shall be provided in accordance with the findings of the risk analysis.

CHAPTER 10
MEANS OF EGRESS

~~**User note:**~~

~~***About this chapter:*** *Chapter 10 provides the general criteria for designing the means of egress established as the primary method for protection of people in buildings by allowing timely relocation or evacuation of building occupants. Both prescriptive and performance language is*

~~*utilized in this chapter to provide for a basic approach in the determination of a safe exiting system for all occupancies. This chapter addresses all portions of the egress system (exit access, exits and exit discharge) and includes design requirements as well as provisions regulating individual components. The requirements detail the size, arrangement, number and protection of means of egress components. Functional and operational characteristics that will permit the safe use of components without special knowledge or effort are specified.*~~

~~*The means of egress protection requirements work in coordination with other sections of the code, such as protection of vertical openings (see Chapter 7), interior finish (see Chapter 8), fire suppression and detection systems (see Chapter 9) and numerous others, all having an impact on life safety. Sections 1003 through 1031 are duplicated text from Chapter 10 of the* International Building Code®*; however, the* International Fire Code® *contains an additional Section 1032 on maintenance of the means of egress system in existing buildings. Retroactive minimum means of egress requirements for existing buildings are found in Chapter 11. Section 1010 was extensively reorganized for the 2021 edition. For complete information, see the relocations table in the preface information for the* International Building Code.~~

SECTION 1001
ADMINISTRATION

[BE] 1001.2 Minimum requirements. It shall be unlawful to alter a building or structure in a manner that will reduce the number of *exits* or the minimum width or required capacity of the *means of egress* to less than required by this code.

SECTION 1003
GENERAL MEANS OF EGRESS

[BE] 1003.2 Ceiling height. The *means of egress* shall have a ceiling height of not less than 7 feet 6 inches (2286 mm) above the finished floor.

Exceptions:

1. Sloped ceilings in accordance with Section 1208.2 of the *International Building Code*.
2. Ceilings of *dwelling units* and *sleeping units* within residential occupancies in accordance with Section 1208.2 of the *International Building Code*.
3. Allowable projections in accordance with Section 1003.3.
4. *Stair* headroom in accordance with Section 1011.3.
5. Door height in accordance with Section 1010.1.1.
6. *Ramp* headroom in accordance with Section 1012.5.2.
7. The clear height of floor levels in vehicular and pedestrian traffic areas of public and private parking garages in accordance with Section 406.2.2 of the *International Building Code*.
8. Areas above and below *mezzanine* floors in accordance with Section 505.2 of the *International Building Code*.

SECTION 1004
OCCUPANT LOAD

[BE] TABLE 1004.5
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT[c]
(Based on function or use and not occupancy classification)

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

[BE] TABLE 1004.5—continued
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR[a]
Assembly	
Gaming floors (keno, slots, etc.)	11 gross
Exhibit gallery and museum	30 net
Assembly with fixed seats	See Section 1004.6
Assembly without fixed seats	
Concentrated (chairs only—not fixed)	7 net
Standing space	5 net
Unconcentrated (tables and chairs)[b]	15 net
Bowling centers, allow 5 persons for each lane including 15 feet of runway, and for additional areas	7 net
Business areas	100 ~~150~~ gross
~~Concentrated business use areas~~	~~See Section 1004.8~~
Courtrooms—other than fixed seating areas	40 net
Day care[d]	35 net[d]
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
Locker rooms	50 gross
Mall buildings—covered and open	See Section 402.8.2 of the *International Building Code*
Mercantile	60 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
Piers and docks	See Section 3606.8 of the *International Building Code*

For SI: 1 square foot = 0.0929 m^2, 1 foot = 304.8 mm.

a. Floor area in square feet per occupant.

b. An assembly occupancy conference room that is accessory to a Group B office occupancy and meeting the requirements of Section 303.1.2 of the *International Building Code*, exception 2, shall be calculated at 100 ~~150~~ square feet per occupant for determining the overall occupant load of the associated floor. The assembly occupancy shall be calculated at 15 square feet per occupant for the purpose of determining egress from the room containing the assembly occupancy.

c. For mixed uses sum all loads before rounding up to the next whole number.

d. Day care facility calculated occupant loads may be based on the occupant load allowed by the State licensing agency.

[BE] 1004.5.1 Increased occupant load. ~~The~~ Where approved by the building official, the *occupant load* permitted in any building, or portion thereof, is permitted to be increased from that number established for the occupancies in Table 1004.5, provided that all other requirements of the code are met based on such modified number and the *occupant load* does not exceed one occupant per 7 square feet (0.65 m^2) of occupiable floor space. Where required by the *fire code official*, an *approved aisle*, seating or fixed equipment diagram substantiating any increase in *occupant load* shall be submitted. Where required by the *fire code official*, such diagram shall be posted.

[BE] 1004.8 Concentrated business use areas. Deleted. ~~The *occupant load* factor for concentrated business use shall be applied to telephone call centers, trading floors, electronic data processing centers and similar business use areas with a higher density of occupants than would normally be expected in a typical business occupancy environment. Where *approved* by the code official, the *occupant load* for concentrated business use areas shall be the actual *occupant load*, but not less than one occupant per 50 square feet (4.65 m^2) of gross occupiable floor space.~~

[BE] 1004.9 Posting of occupant load. ~~Every room or space that is an assembly occupancy shall have the *occupant load* of the room or space posted in a conspicuous place, near the main *exit* or *exit access* doorway from the room or space, for the intended configurations. Posted signs shall be of an *approved* legible permanent design and shall be maintained by the *owner* or the *owner*'s authorized agent.~~ Posting of occupant loading shall be in accordance with Section 204.11.2 of the *North Carolina Administrative Code and Policies*.

SECTION 1005
MEANS OF EGRESS SIZING

[BE] 1005.7.1 Doors. Doors, when fully opened, shall not reduce the required width by more than 7 inches (178 mm). Doors in any position shall not reduce the required width by more than one-half.

Exceptions:

1. Surface-mounted latch release hardware shall be exempt from inclusion in the 7-inch maximum (178 mm) encroachment where both of the following conditions exists:
   1.1. The hardware is mounted to the side of the door facing away from the adjacent wall where the door is in the open position.
   1.2. The hardware is mounted not less than 34 inches (865 mm) nor more than 48 inches (1219 mm) above the finished floor.
2. The restrictions on door swing shall not apply to ~~doors within individual *dwelling units* and *sleeping units* of Group R-2 occupancies and *dwelling units* of Group R-3 occupancies~~ the following locations:
   2.1. Within individual dwelling units and sleeping units of Group R-2 occupancies.
   2.2. Dwelling units of Group R-3 occupancies.
   2.3. Janitor closets 15 square feet or less; or
   2.4. Mechanical or electrical rooms that do not include storage.

SECTION 1006
NUMBERS OF EXITS AND EXIT ACCESS DOORWAYS

[BE] 1006.2.1 Egress based on occupant load and common path of egress travel distance. Two *exits* or *exit access doorways* from any space shall be provided where the design *occupant load* or the *common path of egress travel* distance exceeds the values listed in Table 1006.2.1. The cumulative *occupant load* from adjacent rooms, areas or spaces shall be determined in accordance with Section 1004.2.

Exceptions:

1. The number of *exits* from foyers, lobbies, vestibules or similar spaces need not be based on cumulative occupant loads for areas discharging through such spaces, but the capacity of the *exits* from such spaces shall be based on applicable cumulative occupant loads.
2. Care suites in Group I-2 occupancies complying with Section 407.4 of the *International Building Code*.
3. Unoccupied mechanical rooms and penthouses are not required to comply with the *common path of egress travel* distance measurement.

[BE] TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY[i]

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Sprinkler System (feet)		With Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
A[c], E[h], M	49	75	75	75[a]
B	49	100	75	100[a]
F	49	75	75	100[a]

H-1, H-2, H-3	3	NP	NP	25[b]
H-4, H-5	10	NP	NP	75[b]
I-1, I-2[d], I-4	10	NP	NP	75[a]
I-3	10	NP	NP	100[a]
R-1	10	NP	NP	75[a]
R-2	20	NP	NP	125[a]
R-3[e]	20	NP	NP	125[a, g]
R-4[e]	20	NP	NP	125[a, g]
S[f]	29	100	75	100[a]
U	49	100	75	75[a]

For SI: 1 foot = 304.8 mm.
NP = Not Permitted.

a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2
b. Group H occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.2.5.
c. For a room or space used for assembly purposes having fixed seating, see Section 1030.8.
d. For the travel distance limitations in Group I-2, see Section 407.4 of the *International Building Code*.
e. The common path of egress travel distance shall apply only in a Group R-3 occupancy located in a mixed occupancy building or within Group R-3 or R-4 *congregate living facilities*.
f. The length of common path of egress travel distance in a Group S-2 open parking garage shall be not more than 100 feet.
g. For the travel distance limitations in Groups R-3 and R-4 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3, see Section 1006.2.2.6.
h. Day care maximum occupant load is 10.
i. Single exits as allowed by Section 1006.3.4.

SECTION 1008
MEANS OF EGRESS ILLUMINATION

[BE] 1008.3.3 Rooms and spaces. In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:

1. ~~Electrical~~ Main electrical equipment rooms.
2. *Fire command centers*.
3. Fire pump rooms.
4. Generator rooms.
5. Public restrooms ~~with an area greater than 300 square feet (27.87 m^2)~~ where two or more water closets are required by Table 2902.1 of the International Building Code.
6. Sprinkler riser rooms.
7. *Fire protection and life safety system control units*.

Where the above equipment is not in a dedicated room only the working space around the equipment shall be illuminated.

SECTION 1009
ACCESSIBLE MEANS OF EGRESS

[BE] 1009.1 Accessible means of egress required. *Accessible means of egress* shall comply with this section. Accessible spaces shall be provided with not less than one *accessible means of egress*. Where more than one *means of egress* is required by Section

1006.2 or 1006.3 from any accessible space, each accessible portion of the space shall be served by not less than two *accessible means of egress*.

Exceptions:

1. One *accessible means of egress* is required from an accessible *mezzanine* level in accordance with Section 1009.3, 1009.4 or 1009.5.
2. In assembly areas with ramped *aisles* or stepped *aisles*, one *accessible means of egress* is permitted where the common path of travel is accessible and meets the requirements in Section 1030.8.
3. *Accessible means of egress* are not required to be provided in existing buildings unless that component of the means of egress is part of an alteration, renovation, or addition.

[BE] 1009.4.1 Standby power. The elevator shall meet the emergency operation and signaling device requirements of Section 2.27 of ASME A17.1/CSA B44. Standby power shall be provided in accordance with Chapter 27 and Section 3003 of the *International Building Code*. Wiring and cables shall be protected in accordance with Section 3008.8.2 of the *International Building Code*.

[BE] 1009.7.2 Separation. *Exterior walls* separating the exterior area of assisted rescue from the interior of the building shall have a minimum *fire-resistance rating* of 1 hour, rated for exposure to fire from the inside. The *fire-resistance-rated exterior wall* construction shall extend horizontally not less than 10 feet (3048 mm) beyond the landing on either side of the landing or equivalent *fire-resistance-rated* construction is permitted to extend out perpendicular to the *exterior wall* not less than 4 feet (1219 mm) on the side of the landing. The *fire-resistance-rated* construction shall extend vertically from the ground to a point not less than 10 feet (3048 mm) above the floor level of the area for assisted rescue or to the roof line, whichever is lower. Openings within such *fire-resistance-rated exterior walls* shall be protected in accordance with Section 716 of the *International Building Code*.

~~**Exception:**~~ **Exceptions:**

1. The *fire-resistance rating* and opening protectives are not required in the *exterior wall* where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.

2. Areas for assisted rescue that are located not less than 10 feet (3048 mm) from the exterior face of a building are not required to be separated from the building by fire-resistance rated walls or protected openings.

SECTION 1010
DOORS, GATES AND TURNSTILES

[BE] 1010.2.1 Unlatching. The unlatching of any door or leaf for egress shall require not more than one motion in a single linear or rotational direction to release all latching and all locking devices.

Exceptions:

1. Places of detention or restraint.
2. Where manually operated bolt locks are permitted by Section 1010.2.5.
3. Doors with automatic flush bolts as permitted by Section 1010.2.4, Item 4.
4. Doors from individual *dwelling units* and *sleeping units* of Group R occupancies as permitted by Section 1010.2.4, Item 5.
5. Group E classrooms identified by the local school administration as having one or more students that require restraint to preserve the safety of the student or students shall be permitted to have latching devices that require a maximum of two motions to unlatch the door from the egress side.

[BE] 1010.2.4 Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exist:

1. Places of detention or restraint.

2. In Group I-1, Condition 2 and Group I-2 occupancies where the clinical needs of persons receiving care require containment or where persons receiving care pose a security threat, provided that all clinical staff can readily unlock doors at all times, and all such locks are keyed to keys carried by all clinical staff at all times or all clinical staff have the codes or other means necessary to operate the locks at all times.
3. In buildings in occupancy Group A having an *occupant load* of ~~300~~ 100 or less, and Groups B, F, M and S~~, and in *places of religious worship*~~, the main door or doors are permitted to be equipped with a thumb bolt or key-operated locking devices from the egress side provided:
    3.1. The locking device is readily distinguishable as locked and provided with a thumb bolt or key that cannot be removed when locked from the egress side.
    3.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: "THIS DOOR TO REMAIN UNLOCKED WHEN THIS SPACE IS OCCUPIED." The sign shall be in letters 1 inch (25 mm) high on a contrasting background.
    3.3. The use of the thumb bolt or key-operated locking device is revocable by the *building official* for ~~due cause~~ violation of Section 1010.2.4.
4. Where egress doors are used in pairs, *approved* automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts does not have a doorknob or surface-mounted hardware.
5. Doors from individual *dwelling* or *sleeping units* of Group R occupancies having an *occupant load* of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.
6. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism in accordance with *listed* fire door test procedures.
7. Doors serving roofs not intended to be occupied shall be permitted to be locked, preventing entry to the building from the roof.
8. Other than *egress courts*, where occupants must egress from an exterior space through the building for *means of egress*, *exit access* doors shall be permitted to be equipped with an *approved* locking device where installed and operated in accordance with all of the following:
    8.1. The maximum *occupant load* shall be posted where required by Section 1004.9. Such sign shall be permanently affixed inside the building and shall be posted in a conspicuous space near all the *exit access doorways*.
    8.2. A weatherproof telephone or two-way communication system installed in accordance with Sections 1009.8.1 and 1009.8.2 shall be located adjacent to not less than one required *exit access* door on the exterior side.
    8.3. The egress door locking device is readily distinguishable as locked and shall be a key-operated locking device.
    8.4. A clear window or glazed door opening, not less than 5 square feet (0.46 m^2) in area, shall be provided at each *exit access* door to determine if there are occupants using the outdoor area.
    8.5. A readily visible durable sign shall be posted on the interior side on or adjacent to each locked required *exit access* door serving the exterior area stating: "THIS DOOR TO REMAIN UNLOCKED WHEN THE OUTDOOR AREA IS OCCUPIED." The letters on the sign shall be not less than 1 inch (25.4 mm) high on a contrasting background.
    8.6. The *occupant load* of the occupied exterior area shall not exceed 300 occupants in accordance with Section 1004.
9. Locking devices are permitted on doors to balconies, decks or other exterior spaces serving individual *dwelling* or *sleeping units*.
10. Locking devices are permitted on doors to balconies, decks or other exterior spaces of 250 square feet (23.23 m^2) or less, serving a private office space.

[BE] 1010.2.7 Stairway doors. Interior *stairway means of egress* doors shall be openable from both sides without the use of a key or special knowledge or effort.

Exceptions:

1. *Stairway* discharge doors shall be openable from the egress side and shall only be locked from the opposite side.
2. This section shall not apply to doors arranged in accordance with Section 403.5.3 of the *International Building Code*.
3. *Stairway* exit doors are permitted to be locked from the side opposite the egress side, provided that they are openable from the egress side and capable of being unlocked simultaneously without unlatching upon a signal from the *fire command center*, if present, or a signal by emergency personnel from a single location inside the main entrance to the building and upon activation of the fire alarm if present.
4. *Stairway exit* doors shall be openable from the egress side and shall only be locked from the opposite side in Group B, F, M and S occupancies where the only interior access to the tenant space is from a single *exit stairway* where permitted in Section 1006.3.4.
5. *Stairway* exit doors shall be openable from the egress side and shall only be locked from the opposite side in Group R-2 occupancies where the only interior access to the *dwelling unit* is from a single exit stairway where permitted in Section 1006.3.4.

[BE] 1010.2.9 Panic and fire exit hardware. Swinging doors serving a Group H occupancy and swinging doors serving rooms or spaces with an *occupant load* of 50 or more in a Group A or E occupancy shall not be provided with a latch or lock other than *panic hardware* or *fire exit hardware*.

Exceptions:

1. A main *exit* of a Group A occupancy shall be permitted to have locking devices in accordance with Section 1010.2.4, Item 3.
2. Doors provided with *panic hardware* or *fire exit hardware* and serving a Group A or E occupancy shall be permitted to be electrically locked in accordance with Section 1010.2.12 or 1010.2.11.
3. *Exit access* doors serving occupied exterior areas shall be permitted to be locked in accordance with Section 1010.2.4, Item 8.
4. Courtrooms shall be permitted to be locked in accordance with Section 1010.2.13, Item 3.
5. Doors serving a Group A or E occupancy in an I-2 facility shall be permitted to be locked in accordance with Section 1010.2.14.2 or 1010.2.14.3 where the clinical or security needs of the patients require specialized locking measures for their safety or the safety of others.
6. Outdoor swimming pool barrier gates where the barrier height is a maximum of 48 inches when the area served by the gate has a calculated occupant load less than 300.

[BE] 1010.2.9.2 Rooms with electrical equipment. ~~*Exit* or *exit access* doors serving transformer vaults, rooms designated for batteries or energy storage systems, or modular data centers shall be equipped with *panic hardware* or *fire exit hardware*. Rooms containing electrical equipment rated 800 amperes or more that contain overcurrent devices, switching devices or control devices and where the *exit* or *exit access* door is less than 25 feet (7620 mm) from the equipment working space as required by NFPA 70, such doors shall not be provided with a latch or lock other than *panic hardware* or *fire exit hardware*. The doors shall swing in the direction of egress travel.~~ See the NC Electrical Code, Article 110 for electrical room egress hardware requirements.

[BE] 1010.2.13 Delayed egress. Delayed egress locking systems shall be permitted to be installed on doors serving the following occupancies in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved* automatic smoke or heat detection system installed in accordance with Section 907:

1. Group B, F, I, M, R, S and U occupancies.
2. Group E classrooms with an *occupant load* of less than 50.
3. In courtrooms in Group A-3 and B occupancies, delayed egress locking systems shall be permitted to be installed on *exit* or *exit access* doors, other than the main *exit* or *exit access* door, in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

[BE] 1010.2.13.1 Delayed egress locking system. The delayed egress locking system shall be installed and operated in accordance with all of the following:

1. The delay electronics of the delayed egress locking system shall deactivate upon actuation of the *automatic sprinkler system* or automatic fire detection system, allowing immediate, free egress.
2. The delay electronics of the delayed egress locking system shall deactivate upon loss of power controlling the lock or lock mechanism, allowing immediate free egress.
3. The delayed egress locking system shall have the capability of being deactivated at the *fire command center* and other *approved* locations. If a *fire command center* is not required by this code, the door locks shall have the capability of being unlocked by a signal from a location *approved* by the *fire code official*.
4. An attempt to egress shall initiate an irreversible process that shall allow such egress in not more than 15 seconds when a physical effort to exit is applied to the egress side door hardware for not more than 3 seconds. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the delay electronics have been deactivated, rearming the delay electronics shall be by manual means only.

   Exception: Where *approved*, a delay of not more than 30 seconds is permitted on a delayed egress door.

5. The egress path from any point shall not pass through more than one delayed egress locking system.

   Exceptions:

   1. In Group I-1, Condition 2, Group I-2 or I-3 occupancies, the egress path from any point in the building shall pass through not more than two delayed egress locking systems provided that the combined delay does not exceed 30 seconds.
   2. In Group I-1, Condition 1 or Group I-4 occupancies, the egress path from any point in the building shall pass through not more than two delayed egress locking systems provided that the combined delay does not exceed 30 seconds and the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

6. A sign shall be provided on the door and shall be located above and within 12 inches (305 mm) of the door exit hardware:

   Exception: Where *approved*, in Group I occupancies, the installation of a sign is not required where care recipients who, because of clinical needs, require restraint or containment as part of the function of the treatment area.

   6.1. For doors that swing in the direction of egress, the sign shall read: "PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS."

   6.2. For doors that swing in the opposite direction of egress, the sign shall read: "PULL UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS."

   6.3. The sign shall comply with the visual character requirements in ICC A117.1.

7. Emergency lighting shall be provided on the egress side of the door.
8. The delayed egress locking system units shall be *listed* in accordance with UL 294.
9. The egress path shall not pass through a locking system allowed by Section 407.13 of the International Building Code.

[BE] 1010.2.14 Controlled egress doors in Groups I-1, ~~and~~ I-2, and R-4.

1010.2.14.1 Group I-1. Electric locking systems, including electro-mechanical locking systems and electromagnetic locking systems, shall be permitted to be locked in the means of egress in Group I-1 ~~or I-2 occupancies~~ where the clinical needs of persons receiving care require their containment. Controlled egress doors shall be permitted in such occupancies where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved* automatic smoke detection system installed in accordance with Section 907, provided that the doors are installed and operate in accordance with all of the following:

1. The door locks shall unlock on actuation of the *automatic sprinkler system* or automatic smoke detection system.
2. The door locks shall unlock on loss of power controlling the lock or lock mechanism.

3. The door locking system shall be installed to have the capability of being unlocked by a switch located at the *fire command center*, a nursing station or other *approved* location. The switch shall directly break power to the lock.
4. A building occupant shall not be required to pass through more than one door equipped with a controlled egress locking system before entering an *exit*.
5. The procedures for unlocking the doors shall be described and *approved* as part of the emergency planning and preparedness required by Chapter 4.
6. All clinical staff shall have the keys, codes or other means necessary to operate the locking systems.
7. Emergency lighting shall be provided at the door.
8. The door locking system units shall be *listed* in accordance with UL 294.

Exceptions:

~~1.~~ Items 1 through 4 shall not apply to doors to areas occupied by persons who, because of clinical needs, require restraint or containment as part of the function of a psychiatric or cognitive treatment area.

~~2. Items 1 through 4 shall not apply to doors to areas where a *listed* egress control system is utilized to reduce the risk of child abduction from nursery and obstetric areas of a Group I-2 hospital.~~

1010.2.14.2 Group I-2. See Section 407.13 of the *International Building Code*. Door-locking arrangements shall be permitted in Group I-2 where the clinical or security needs of the patients require specialized locking measures for their safety or the safety of others, provided keys are carried at all times by staff that are responsible for the evacuation of the occupants within the locked building unit(s). Provisions for remote locking and unlocking of occupied rooms are required where more than ten locks are necessary to be unlocked in order to move occupants from one smoke compartment to another smoke compartment. These locks may include mechanical locks, electromagnetic locks and other approved locking devices.

1010.2.14.3 Special locking arrangements for Licensed Group I-2 and Group R-4 large residential care facilities as described in Section 430 of the *International Building Code*. See Section 407.13 of the *International Building Code*.

SECTION 1011
STAIRWAYS

[BE] 1011.4 Walkline. The walkline across *winder* treads shall be concentric to the direction of travel through the turn and located 12 inches (305 mm) horizontally from the handrail that is adjacent to the side where the *winders* are narrower. The 12-inch (305 mm) dimension shall be measured ~~from the widest point of the clear *stair* width at the walking surface of the *winder*~~ perpendicular from the handrail surface that faces the walkline. ~~Where *winders* are adjacent within the *flight*, the point of the widest clear *stair* width of the adjacent *winders* shall be used.~~

[BE] 1011.12.2 Roof access. Where a *stairway* is provided to a roof, access to the roof shall be provided through a penthouse complying with Section 1511.2 of the *International Building Code*.

Exception: In buildings without an occupied roof, access to the roof shall be permitted to be a roof hatch or trap door not less than 16 square feet (1.5 m^2) in area and having a minimum dimension of 2 feet (610 mm). A minimum clearance perpendicular to the ladder or alternating tread device stringer shall be 36 inches (914 mm).

[BE] 1011.15 Ship's ladders. Ship's ladders are permitted to be used in Group I-3 as a component of a *means of egress* to and from control rooms or elevated facility observation stations not more than 250 square feet (23 m^2) with not more than three occupants and for access to unoccupied roofs. The minimum clear width at and below the *handrails* shall be 20 inches (508 mm). Ship's ladders shall be designed for the live loads indicated in Section 1607.17 of the *International Building Code*. The maximum width to the outside of the handrails shall be of 30 inches (762 mm). The vertical rise between floor levels or landings shall not exceed 20 feet (6096 mm). Ship's ladders shall be designed for the live loads indicated in Section 1607.17.

[BE] 1011.15.1 Handrails of ship's ladders. 1¼-inch (31.75 mm) pipe *handrails* ~~*Handrails*~~ shall be provided on both sides of ship's ladders.

[BE] 1011.15.2 Treads of ship's ladders. Ship's ladders shall have a~~minimum tread depth of 5 inches (127 mm). The tread shall be projected such that the total of the tread depth plus the *nosing* projection is not less than 8½ inches (216 mm). The maximum riser height shall be 9½ inches (241 mm).~~:

1. Pitch of 60 to 75 degrees,

2. Minimum tread depth of 5 inches, and

3. Riser height of 9-1/2 inches to 12 inches.

[BE] 1011.16 Ladders. Permanent ladders shall not serve as a part of the *means of egress* from occupied spaces within a building. Permanent ladders shall be constructed in accordance with Section 306.5 of the *International Mechanical Code* and designed for the live loads indicated in Section 1607.17 of the *International Building Code*. Permanent ladders shall be allowed ~~permitted~~ to provide access to the following areas:

1. Spaces frequented only by personnel for maintenance, repair or monitoring of equipment.
2. Nonoccupiable spaces accessed only by catwalks, crawl spaces, freight elevators or very narrow passageways.
3. Raised areas used primarily for purposes of security, life safety or fire safety including, but not limited to, observation galleries, prison guard towers, fire towers or lifeguard stands.
4. Elevated levels in Group U not open to the general public.
5. Nonoccupied roofs that are not required to have *stairway* access in accordance with Section 1011.12.1.
6. Where allowed ~~permitted~~ to access equipment and appliances in accordance with Section 306.5 of the *International Mechanical Code*.

SECTION 1013
EXIT SIGNS

[BE] 1013.2 Low-level exit ~~door~~ signs in Group R-1. Where exit signs are required in Group R-1 occupancies by Section 1013.1, additional low-level exit signs shall be provided in all areas serving guestrooms in Group R-1 occupancies and shall comply with Section 1013.5.

The bottom of the sign shall be not less than 10 inches (254 mm) nor more than 18 inches (455 mm) above the floor level. The sign shall be flush mounted to the door or wall. Where mounted on the wall, the edge of the sign shall be within 4 inches (102 mm) of the door frame on the latch side.

[BE] 1013.3 Illumination. Exit signs shall be internally or externally illuminated.

~~Exception~~ Exceptions:

1. Tactile signs required by Section 1013.4 need not be provided with illumination.

2. Lighted exit signs are not required for Group R *open air cabins*.

SECTION 1014
HANDRAILS

[BE] 1014.6 Handrail extensions. *Handrails* shall return to a wall, *guard* or the walking surface or shall be continuous to the *handrail* of an adjacent *flight* of *stairs* or *ramp* run. Where *handrails* are not continuous between *flights* the *handrails* shall extend horizontally not less than 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At *ramps* where *handrails* are not continuous between runs, the *handrails* shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of *ramp* runs. The extensions of *handrails* shall be in the same direction of the *flights* of *stairs* at *stairways* and the *ramp* runs at *ramps*.

Exceptions:

1. *Handrails* within a *dwelling unit* that is not required to be accessible need extend only from the top riser to the bottom riser.

2. *Handrails* serving *aisles* in rooms or spaces used for assembly purposes are permitted to comply with the handrail extensions in accordance with Section 1030.16.
3. *Handrails* for *alternating tread devices* and ship's ladders are permitted to terminate at a location vertically above the top and bottom risers. *Handrails* for *alternating tread devices* are not required to be continuous between *flights* or to extend beyond the top or bottom risers.
4. Extensions into a path of travel may return along the face of a continuing wall, column, or circulation path.

SECTION 1015
GUARDS

[BE] 1015.2 Where required. *Guards* shall be located along open-sided walking surfaces, including *mezzanines*, equipment platforms, *aisles*, *stairs*, *ramps*, ~~and~~ landings and retaining walls that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. See Section 3606.6 of the *International Building Code* for piers, docks, catwalks, gangways and floating docks and Section 3607.1.3 of the *International Building Code* for bulkheads.*Guards* shall be adequate in strength and attachment in accordance with Section 1607.9 of the *International Building Code*.

Exception: *Guards* are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of stages and raised platforms, including *stairs* leading up to the stage and raised platforms.
3. On raised stage and platform floor areas, such as runways, *ramps* and side stages used for entertainment or presentations.
4. At vertical openings in the performance area of stages and platforms.
5. At elevated walking surfaces appurtenant to stages and platforms for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating areas at cross *aisles* in accordance with Section 1030.17.2.
8. On the loading side of station platforms on fixed guideway transit or passenger rail systems.
9. At retaining walls where the walking surface is more than 6 feet from the adjacent open face of the retaining wall or the retaining wall is in the public right-of-way.

[BE] 1015.4 Opening limitations. Required *guards* shall not have openings that allow passage of a sphere 4 inches (102 mm) in diameter from the walking surface to the required *guard* height. The sphere shall not pass through the opening with a minimum of 50 psf applied horizontally to the sphere from the direction of the walking surface that is being protected. A bottom rail or curb shall be provided that will reject the passage of a 2-inch-diameter (51mm) sphere.

Exceptions:

1. From a height of 36 inches (914 mm) to 42 inches (1067 mm), *guards* shall not have openings that allow passage of a sphere $4^{3}/_{8}$ inches (111 mm) in diameter.
2. The triangular openings at the open sides of a *stair*, formed by the riser, tread and bottom rail shall not allow passage of a sphere 6 inches (152 mm) in diameter.
3. At elevated walking surfaces for access to and use of electrical, mechanical or plumbing systems or equipment, *guards* shall not have openings that allow passage of a sphere 21 inches (533 mm) in diameter.
4. In areas that are not open to the public within occupancies in Group I-3, F, H or S, and for *alternating tread devices* and ship's ladders, *guards* shall not have openings that allow passage of a sphere 21 inches (533 mm) in diameter.
5. In assembly seating areas, *guards* required at the end of *aisles* in accordance with Section 1030.17.4 shall not have openings that allow passage of a sphere 4 inches (102 mm) in diameter up to a height of 26 inches (660 mm). From a height of 26 inches (660 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, *guards* shall not have openings that allow passage of a sphere 8 inches (203 mm) in diameter.

6. Within individual *dwelling units* and *sleeping units* in Group R-2 and R-3 occupancies, *guards* on the open sides of *stairs* shall not have openings that allow passage of a sphere $4^{3}/_{8}$ (111 mm) inches in diameter.
7. In child day care facilities any opening in equipment, steps, decks, handrails, and fencing shall be smaller than $3^{1}/_{2}$ inches or greater than 9 inches.

SECTION 1016
EXIT ACCESS

[BE] 1016.2 Egress through intervening spaces. Egress through intervening spaces shall comply with this section.

1. *Exit access* through an enclosed elevator lobby is permitted. Where access to two or more *exits* or *exit access doorways* is required in Section 1006.2.1, access to not less than one of the required *exits* shall be provided without travel through the enclosed elevator lobbies required by Section 3006 of the *International Building Code*. Where the path of *exit access* travel passes through an enclosed elevator lobby the level of protection required for the enclosed elevator lobby is not required to be extended to the *exit* unless direct access to an *exit* is required by other sections of this code.
2. Egress from a room or space shall not pass through adjoining or intervening rooms or areas, except where such adjoining rooms or areas and the area served are accessory to one or the other, are not a Group H occupancy and provide a discernible path of egress travel to an *exit*.

   Exception: *Means of egress* are not prohibited through adjoining or intervening rooms or spaces in a Group H, S or F occupancy where the adjoining or intervening rooms or spaces are the same or a lesser hazard occupancy group.
3. An *exit access* shall not pass through a room that can be locked to prevent egress.
4. *Means of egress* from *dwelling units* or sleeping areas shall not lead through other sleeping areas, toilet rooms or bathrooms.
5. Egress shall not pass through kitchens, storage rooms, closets or spaces used for similar purposes.

   Exceptions:

   1. *Means of egress* are not prohibited through a kitchen area serving adjoining rooms constituting part of the same *dwelling unit* or *sleeping unit*.
   2. *Means of egress* are not prohibited through stockrooms in Group M occupancies where all of the following are met:

      2.1. The stock is of the same hazard classification as that found in the main retail area.

      2.2. Not more than 50 percent of the *exit access* is through the stockroom.

      2.3. The stockroom is not subject to locking from the egress side.

      2.4. There is a demarcated, minimum 44-inch-wide (1118 mm) *aisle* defined by full- or partial-height fixed walls or similar ~~construction~~ barrier that will maintain the required width and lead directly from the retail area to the *exit* without obstructions.

SECTION 1019
EXIT ACCESS STAIRWAYS AND RAMPS

1019.5 Construction. *Exit access stairways* and *ramps* may be unenclosed or in unrated enclosures. Exterior *exit access stairways* and *ramps* shall not require separation from the building interior.

Exception: *Exit access stairway* and *ramp* enclosures required by 1019.4.

SECTION 1020
CORRIDORS

[BE] 1020.2 Construction. *Corridors* shall be *fire-resistance rated* in accordance with Table 1020.2. The *corridor* walls required to be *fire-resistance rated* shall comply with Section 708 of the *International Building Code* for *fire partitions*.

~~**Exceptions:**~~

~~1. A *fire-resistance rating* is not required for *corridors* in an occupancy in Group E where each room that is used for instruction has not less than one door opening directly to the exterior and rooms for assembly purposes have not less than one-half of the required *means of egress* doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.~~

~~2. A *fire-resistance rating* is not required for *corridors* contained within a *dwelling unit* or *sleeping unit* in an occupancy in Groups I-1 and R.~~

~~3. A *fire-resistance rating* is not required for *corridors* in open parking garages.~~

~~4. A *fire-resistance rating* is not required for *corridors* in an occupancy in Group B that is a space requiring only a single *means of egress* complying with Section 1006.2.~~

~~5. *Corridors* adjacent to the *exterior walls* of buildings shall be permitted to have unprotected openings on unrated *exterior walls* where unrated walls are permitted by Table 705.5 of the *International Building Code* and unprotected openings are permitted by Table 705.8 of the *International Building Code*.~~

[BE] TABLE 1020.2
CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system
H-1, H-2, H-3	All	Not Permitted	1[c]
H-4, H-5	Greater than 30	Not Permitted	1[c]
A, B[g,k], E[e,h], F, M, S[i], U	Greater than 30	1	0
R[f,i]	Greater than 10	Not Permitted	0.5[c]/1[d]
I-2[a]	All	Not Permitted	0
I-1[i], I-3	All	Not Permitted	1[b, c]
I-4	All	1	0

a. For requirements for occupancies in Group I-2, see Sections 407.2 and 407.3 of the *International Building Code*.
b. For a reduction in the fire-resistance rating for occupancies in Group I-3, see Section 408.8 of the *International Building Code*.
c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 where allowed.
d. Group R-3 and R-4 buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3. See Section 903.2.8 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.3.
e. Adult and child day care facilities without automatic sprinkler systems shall have 1-hour fire-resistance-rated corridors regardless of occupant load.
f. For residential care facilities requirements see Section 430 of the *International Building Code*.
g. Exit access corridors are not required to be rated on any single tenant floor or in any single tenant space, if 1-hour fire-resistance-rated floor/ceiling assemblies are provided in multistory buildings and fire partitions are provided between other tenant spaces on the same floor. The structure supporting such floor/ceiling assemblies and fire partitions is not required to be rated in Types IIB, IIIB and VB construction.
h. A *fire-resistance rating* is not required for *corridors* in an occupancy in Group E where each room that is used for instruction has not less than one door opening directly to the exterior and rooms for assembly purposes have not less than one-half of the required *means of egress* doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.
i. A *fire-resistance rating* is not required for *corridors* contained within a *dwelling unit* or *sleeping unit* in Groups I-1 and R.
j. A *fire-resistance rating* is not required for *corridors* in *open parking garages*.
k. A *fire-resistance rating* is not required for *corridors* in an occupancy in Group B which is a space requiring only a single *means of egress* complying with Section 1006.2.
l. *Corridors* adjacent to the *exterior walls* of buildings shall be permitted to have unprotected openings on unrated *exterior walls* where unrated walls are permitted by Table 705.5 of the *International Building Code* ~~602~~ and unprotected openings are permitted by Table 705.8 of the *International Building Code*.

[BE] TABLE 1020.3
MINIMUM CORRIDOR WIDTH

OCCUPANCY	MINIMUM WIDTH (inches)
Any facility not listed below	44
Access to and utilization of mechanical, plumbing or electrical systems or equipment	24
In other than Group I-1, I-2 and I-3 with ~~With~~ an *occupant load* of less than 50	36
Within a dwelling unit	36
In Group E with a corridor having a occupant load of 100 or more	72
In corridors and areas serving stretcher traffic in ambulatory care facilities and resident areas of Group I-1 and I-2	72
Group I-2 in patient areas and in areas where required for bed movement	96

For SI: 1 inch = 25.4 mm.

[BE] 1020.7 Corridor continuity. *Fire-resistance-rated corridors* shall be continuous from the point of entry to an *exit*, and shall not be interrupted by intervening rooms. Where the path of egress travel within a *fire-resistance-rated corridor* to the *exit* includes travel along unenclosed *exit access stairways* or *ramps*, the *fire-resistance-rating* shall be continuous for the length of the *stairway* or *ramp* and for the length of the connecting *corridor* on the adjacent floor leading to the *exit*.

Exceptions:

1. Foyers, lobbies or reception rooms constructed as required for *corridors* shall not be construed as intervening rooms.
2. Enclosed elevator lobbies as permitted by Item 1 of Section 1016.2 shall not be construed as intervening rooms.
3. A toilet room as defined by the NC Plumbing Code that meets all of the following requirements may be included as part of the rated corridor enclosure:

   3.1. The toilet room shall be separated from the remainder of the building by fire-resistant-rated construction meeting the same requirements as the corridor construction;

   3.2. No other rooms open off of the toilet room;

   3.3. No gas or electric appliances other than electric point of use water heaters and hand dryers are located in the toilet room; and

   3.4. The toilet room is not used for any other purpose.

SECTION 1023
INTERIOR EXIT STAIRWAYS AND RAMPS

[BE] 1023.2 Construction. Enclosures for *interior exit stairways* and *ramps* shall be constructed as *fire barriers* in accordance with Section 707 of the *International Building Code* or *horizontal assemblies* constructed in accordance with Section 711 of the *International Building Code*, or both. *Interior exit stairway* and *ramp* enclosures shall have a *fire-resistance rating* of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the *interior exit stairways* or *ramps* shall include any *basements*, but not any *mezzanines*. Enclosures for *interior exit stairways* and *ramps* shall have a *fire-resistance rating* not less than the floor assembly penetrated, but need not exceed 2 hours.

Exceptions:

1. *Interior exit stairways* and *ramps* in Group I-3 occupancies in accordance with the provisions of Section 408.3.8 of the *International Building Code*.
2. *Interior exit stairways* within an atrium enclosed in accordance with Section 404.6 of the *International Building Code*.
3. *Interior exit stairways* in accordance with Section 510.2 of the *International Building Code*.
4. In other than Group H and I occupancies, a maximum of 50 percent of egress stairways serving one adjacent floor are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Any two such interconnected floors shall not open to other floors. Unenclosed exit stairways shall be remotely located as required in Section 1007.1.1.
5. In other than Group H and I occupancies, interior egress stairways serving only the first and second stories of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Such interconnected stories shall not be open to other stories. Unenclosed exit stairways shall be remotely located as required in Section 1007.1.1.
6. *Exit access stairways* and *ramps* that are either unenclosed or in allowed unrated enclosures.

SECTION 1030
ASSEMBLY

[BE] 1030.9.5 ~~Dead-end aisles.~~ Assembly aisle termination. Each end of an *aisle* shall be continuous to a cross *aisle*, foyer, doorway, vomitory, concourse or *stairway* in accordance with Section 1030.9.7 having access to an *exit*.

Exceptions:

1. Dead-end *aisles* shall be not greater than 20 feet (6096 mm) in length.
2. Dead-end *aisles* longer than ~~16 rows~~ 20 feet (6096 mm) are permitted where seats beyond the ~~16 rows~~ 20 feet (6096 mm) dead-end *aisle* are not more than 24 seats from another *aisle*, measured along a row of seats having a minimum clear width of 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row where seats have backrests or beyond 10 where seats are without backrests in the row.
3. For *smoke-protected* or *open-air assembly seating*, the dead-end *aisle* length of vertical *aisles* shall not exceed a distance of 21 rows.
4. For *smoke-protected* or *open-air assembly seating*, a longer dead-end *aisle* is permitted where seats beyond the 21-row dead-end *aisle* are not more than 40 seats from another *aisle*, measured along a row of seats having an *aisle accessway* with a minimum clear width of 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat above seven in the row where seats have backrests or beyond 10 where seats are without backrests in the row.

SECTION 1031
EMERGENCY ESCAPE AND RESCUE

[BE] 1031.2 Where required. In addition to the *means of egress* required by this chapter, *emergency escape and rescue openings* shall be provided in the following ~~occupancies~~:

1. Group R-2 occupancies located in stories with only one *exit* or *access* to only one *exit* as permitted by Tables 1006.3.4(1) and 1006.3.4(2).
2. ~~Group R-3 and~~ R-4 occupancies.
3. Group R-2 and R-3 occupancies located below the fourth story without automatic fire sprinkler systems.
4. Group E classrooms without automatic fire sprinkler systems where a minimum of one of the following applies:
   1. *Cooperative Innovative High School Programs*.
   2. Places of worship not used as a private or public school.

3. Classrooms with less than 2 means of egress.

4. Classrooms or spaces complying with all the following:

4.1 Doors open directly to a corridor with exit access in one direction and provide access through adjacent classrooms or directly to a separate smoke compartment with exit access in the other direction, and

4.2 The compartments are separated by smoke barriers having a 1-hour fire resistance rating with self-closing or automatic closing doors, and

4.3 The length of travel to exits along such paths shall not exceed 150 ft. (45 m) and

4.4 Each communicating door shall be identified, and

4.5 No locking device shall be allowed on the communicating doors.

Exceptions:

1. *Basements* with a ceiling height of less than 80 inches (2032 mm) shall not be required to have *emergency escape and rescue openings*.
2. *Emergency escape and rescue openings* are not required from ~~classrooms with 2 means of egress,~~ *basements*, or sleeping rooms that have an *exit* door or *exit access* door that opens directly into a *public way* or to a *yard*, court or exterior egress balcony that opens to a *public way*.
3. *Basements* without *habitable spaces* and having not more than 200 square feet (18.6 m^2) in floor area shall not be required to have *emergency escape and rescue openings*.
4. *Storm shelters* are not required to comply with this section where the shelter is constructed in accordance with ICC 500.
5. ~~Within individual *dwelling* and *sleeping units* in Groups R-2 and R-3, where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3, *sleeping*~~ *Sleeping rooms* in *basements* shall not be required to have *emergency escape and rescue openings* provided that the basement has one of the following:
   5.1. One *means of egress* and one *emergency escape and rescue opening*.
   5.2. Two *means of egress*.

[BE] 1031.3.3 Maximum height from floor. *Emergency escape and rescue openings* shall have the bottom of the clear opening not greater than 44 inches (1118 mm) measured from the floor. For classrooms serving children Grade 5 and younger, the bottom of the clear opening shall be not more than 32 inches (810 mm) measured from the finished floor.

[BE] 1031.4 Emergency escape and rescue doors. Where a door is provided as the required *emergency escape and rescue*

SECTION 1032
MAINTENANCE OF THE MEANS OF EGRESS

1032.2.1.1 Fire escapes. Security enclosures, fences or screening for fire escape stairways and ladders shall be *approved* by the *fire code official* and shall be constructed such that they do not impede egress to the *public way*. Means shall be provided for emergency personnel to access the fire escape stairways and ladders from the exterior of the enclosure.

[BE] 1032.4 Exit signs. Exit signs shall be installed and maintained in accordance with the building code that was in effect at the time of construction. ~~and the applicable provisions in Section 1104.~~ Decorations, furnishings, equipment or adjacent signage that impairs the visibility of exit signs, creates confusion or prevents identification of the *exit* shall not be allowed.

1032.9 Floor identification signs. The floor identification signs required by Sections 1023.9 ~~and 1104.24~~ shall be maintained in an *approved* manner.

1032.10 Emergency lighting equipment inspection and testing. Emergency lighting, including means of egress illumination and exit signs, not covered by NFPA 110 and NFPA 111 shall be maintained in accordance with Section 109 and shall be inspected and tested in accordance with Sections 1032.10.1 and 1032.10.2.

1032.10.1 Activation test. Emergency lighting equipment and exit signs shall be tested monthly for a duration of not less than 30 seconds. The test shall be performed manually or by an automated self-testing and self-diagnostic routine. Where testing is performed by self-testing and self-diagnostics, a visual inspection of the emergency lighting equipment shall be conducted monthly to identify any equipment displaying a trouble indicator or that has become damaged or otherwise impaired.

1032.10.2 Power test. Battery-powered emergency lighting equipment and exit signs shall be tested annually by operating the equipment on battery power for not less than 90 minutes.

1032.11 Fire Escape Stairways. All fire escape *stairways* and *ladders* shall be kept clear and unobstructed at all times and shall be maintained in good working order. All fire escape *stairways* that need to be replaced or repaired shall comply with the requirements of the *International Existing Building Code*.

1032.11.1 Examination. Fire escape *stairways*, balconies, and *ladders* shall be examined for structural adequacy and safety in accordance with Section 1031.10 by a *registered design professional* every 5 years, or as required by the fire code official.

1032.11.2 Examination Report. Records of inspections, testing, and maintenance shall be maintained in accordance with Section 107.3.

1032.11.3 Marking. The open space under fire escape *stairways* or *ladders* shall not be used for any purpose. *Approved* signs or other approved markings that include the words FIRE ESCAPE – KEEP CLEAR shall be provided to prohibit the obstruction thereof.

CHAPTER 11

CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS

Deleted

~~***User note:***~~

~~***About this chapter:*** *Chapter 11 applies to existing buildings constructed prior to the adoption of the code and is intended to ensure a minimum degree of fire and life safety to persons occupying existing buildings by providing for alterations to such buildings that do not comply with the minimum requirements of the International Building Code®. The provisions address general fire safety features such as requirements for fire alarm systems in some existing buildings and general means of egress, and include a section dedicated to existing Group I-2 occupancies.*~~

~~*SECTION 1101*~~
~~*GENERAL*~~

~~***1101.1 Scope.*** *The provisions of this chapter shall apply to existing buildings* constructed prior to the adoption of this code.~~

~~**1101.2 Intent.** The intent of this chapter is to provide a minimum degree of fire and life safety to persons occupying existing buildings by providing minimum construction requirements where such existing buildings do not comply with the minimum requirements of the *International Building Code*.~~

~~**1101.3 Permits.** Permits shall be required as set forth in Sections 105.5 and 105.6 and the *International Building Code*.~~

~~**1101.4 Owner notification.** When a building is found to be in noncompliance with this chapter, the *fire code official* shall duly notify the *owner* of the building. Upon receipt of such notice, the *owner* shall, subject to the following time limits, take necessary actions to comply with the provisions of this chapter.~~

1101.4.1 Construction documents. *Construction documents* necessary to comply with this chapter shall be completed and submitted within a time schedule *approved* by the *fire code official*.

1101.4.2 Completion of work. Work necessary to comply with this chapter shall be completed within a time schedule *approved* by the *fire code official*.

1101.4.3 Extension of time. The *fire code official* is authorized to grant necessary extensions of time where it can be shown that the specified time periods are not physically practical or pose an undue hardship. The granting of an extension of time for compliance shall be based on the showing of good cause and subject to the filing of an acceptable systematic plan of correction with the *fire code official*.

SECTION 1102
DEFINITIONS

1102.1 Definitions. The following terms are defined in Chapter 2:

DUTCH DOOR.

EXISTING.

SECTION 1103
FIRE SAFETY REQUIREMENTS FOR EXISTING BUILDINGS

1103.1 Required construction. Existing buildings shall comply with not less than the minimum provisions specified in Table 1103.1 and as further enumerated in Sections 1103.2 through 1103.10.

The provisions of this chapter shall not be construed to allow the elimination of *fire protection systems* or a reduction in the level of fire safety provided in buildings constructed in accordance with previously adopted codes.

Exceptions:

1. Where a change in *fire-resistance rating* has been *approved* in accordance with Section 501.2 or 802.6 of the *International Existing Building Code*.
2. Group U occupancies.

TABLE 1103.1
OCCUPANCY AND USE REQUIREMENTS[a]

SECTION	USE				OCCUPANCY CLASSIFICATION																	
	High-rise	Atrium or covered mall	Underground building	Tire storage	A	B	E	F	H-1	H-2	H-3	H-4	H-5	I-1	I-2	I-3	I-4	M	R-1	R-2	R-3	R-4	S
1103.2	R	R	R	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	—	—	R
1103.3	R	—	R	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	—	—	R
1103.4.1	R	—	R	—	—	—	—	—	—	—	—	—	—	—	R	R	—	—	—	—	—	—	—
1103.4.2	R	—	R	—	R	R	R	R	R	R	R	R	R	R	—	—	R	R	R	R	—	—	R
1103.4.3	R	—	R	—	R	R	R	R	R	R	R	R	R	R	—	—	R	R	R	R	—	—	R
1103.4.4	—	R	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1103.4.5	—	—	—	—	—	R	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—
1103.4.6	—	—	—	—	R	—	R	R	R	R	R	R	R	R	R	R	R	—	R	R	R	R	R
1103.4.7	—	—	—	—	R	—	R	R	R	R	R	R	R	R	R	R	R	—	R	R	R	R	R
1103.4.8	R	—	R	—	R	R	R	R	R	R	R	R	R	R	—	—	R	R	R	R	R	R	R

1103.4.9	R	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—
1103.4.10	—	—	—	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
1103.5.1	—	—	—	—	R[c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1103.5.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—
1103.5.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R[b]	—	—	—	—	—	—	—	—
1103.5.5	—	—	—	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
1103.6.1	R	—	R	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	—	—	R
1103.6.2	R	—	R	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	—	—	R
1103.7.1	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1103.7.2	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—	—
1103.7.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—
1103.7.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—
1103.7.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—
1103.7.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—
1103.8	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	R	R	R	R	—
1103.9	R	—	—	—	—	—	—	—	—	—	—	—	—	R	R	—	R	—	R	R	R	R	—
1103.10	—	—	—	—	—	—	—	—	—	—	—	—	—	R	R	—	—	—	—	—	—	—	—
1104	R	R	R	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
1105	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—
1106	—	—	—	R	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

R = The building is required to comply.

a. Existing buildings shall comply with the sections identified as "Required" (R) based on occupancy classification or use, or both, whichever is applicable.

b. Only applies to Group I-2, Condition 2 occupancies as established by the adopting ordinance or legislation of the jurisdiction.

c. Only applies to Group A-2 occupancies where alcoholic beverages are consumed.

1103.1.1 Historic buildings. Facilities designated as historic buildings shall develop a fire protection plan in accordance with NFPA 914. The fire protection plans shall comply with the maintenance and availability provisions in Sections 404.3 and 404.4.

1103.2 Emergency responder communication coverage in existing buildings. Existing buildings other than Group R-3, that do not have *approved* in-building, two-way emergency response communication coverage for emergency responders in the building based on existing coverage levels of the public safety communication systems, shall be equipped with such coverage according to one of the following:

1. Where an existing wired communication system cannot be repaired or is being replaced, or where not *approved* in accordance with Section 510.1, Exception 1.

2. Within a time frame established by the adopting authority.

Exception: Where it is determined by the *fire code official* that the in-building, two-way emergency responder communication coverage system is not needed.

1103.3 Existing elevators. In other than Group R-3, existing elevators, escalators and moving walks shall comply with the requirements of Sections 1103.3.1 and 1103.3.2.

1103.3.1 Elevators, escalators and moving walks. Existing elevators, escalators and moving walks in Group I-2, Condition 2 occupancies and serving ambulatory care facilities shall comply with ASME A17.3.

1103.3.2 Elevator emergency operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more above or below the main floor or other level of a building and intended to serve the needs of emergency personnel for fire fighting or rescue purposes shall be provided with emergency operation in accordance with ASME A17.3.

Exceptions:

1. Buildings without occupied floors located more than 55 feet (16 764 mm) above or 25 feet (7620 mm) below the lowest level of fire department vehicle access where protected at the elevator shaft openings with additional fire doors in accordance with Section 716 of the *International Building Code* and where all of the following conditions are met:
    1.1. The doors shall be provided with vision panels of *approved* fire protection rated glazing so located as to furnish clear vision of the approach to the elevator. Such glazing shall not exceed 100 square inches (0.065 m^2) in area.
    1.2. The doors shall be held open but be automatic closing by activation of a fire alarm initiating device installed in accordance with the requirements of NFPA 72 as for Phase I Emergency Recall Operation, and shall be located at each floor served by the elevator; in the associated elevator machine room, control space, or control room; and in the elevator hoistway, where sprinklers are located in those hoistways.
    1.3. The doors, when closed, shall have signs visible from the approach area stating: "WHEN THESE DOORS ARE CLOSED OR IN FIRE EMERGENCY, DO NOT USE ELEVATOR. USE EXIT STAIRWAYS."
2. Buildings without occupied floors located more than 55 feet (16 764 mm) above or 25 feet (7620 mm) below the lowest level of fire department vehicle access where provided with *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Freight elevators in buildings provided with both *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and not less than one ASME 17.3 compliant elevator serving the same floors.

Elimination of previously installed Phase I emergency recall or Phase II emergency in-car systems shall not be permitted.

1103.4 Vertical openings. Interior vertical openings, including but not limited to *stairways*, elevator hoistways, service and utility shafts, that connect two or more stories of a building shall be enclosed or protected as specified in Sections 1103.4.1 through 1103.4.10.

1103.4.1 Group I-2 and I-3 occupancies. In Group I-2 and I-3 occupancies, interior vertical openings connecting two or more stories shall be protected with 1-hour *fire-resistance-rated* construction.

Exceptions:

1. In Group I-2, unenclosed vertical openings not exceeding two connected stories and not concealed within the building construction shall be permitted as follows:
    1.1. The unenclosed vertical openings shall be separated from other unenclosed vertical openings serving other floors by a *smoke barrier*.
    1.2. The unenclosed vertical openings shall be separated from *corridors* by smoke partitions.
    1.3. The unenclosed vertical openings shall be separated from other fire or *smoke compartments* on the same floors by a *smoke barrier*.
    1.4. On other than the lowest level, the unenclosed vertical openings shall not serve as a required *means of egress*.
2. In Group I-2, atriums connecting three or more stories shall not require 1-hour *fire-resistance-rated* construction where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3, and all of the following conditions are met:
    2.1. For other than existing *approved* atriums with a smoke control system, where the atrium was constructed and is maintained in accordance with the code in effect at the time the atrium was created, the atrium shall have a smoke control system that is in compliance with Section 909.
    2.2. Glass walls forming a smoke partition or a glass block wall assembly shall be permitted where in compliance with Condition 2.2.1 or 2.2.2.

2.2.1. Glass walls forming a smoke partition shall be permitted where all of the following conditions are met:

2.2.1.1. Automatic sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway or occupied space on the atrium side.

2.2.1.2. The sprinklers shall be not more than 12 inches (305 mm) away from the face of the glass and at intervals along the glass of not greater than 72 inches (1829 mm).

2.2.1.3. Windows in the glass wall shall be nonoperating type.

2.2.1.4. The glass wall and windows shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the sprinkler system operates.

2.2.1.5. The sprinkler sys-tem shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction.

2.2.2. A *fire barrier* is not required where a glass block wall assembly complying with Section 2110 of the *International Building Code* and having a $^{3}/_{4}$ hour *fire protection rating* is provided.

2.3. Where doors are provided in the glass wall, they shall be either self closing or automatic closing and shall be constructed to resist the passage of smoke.

3. In Group I 3 occupancies, exit *stairways* or *ramps* and *exit access stairways* or *ramps* constructed in accordance with Section 408 of the *International Building Code*.

1103.4.2 Three to five stories. In other than Group I 2 and I 3 occupancies, interior vertical openings connecting three to five stories shall be protected by either 1 hour *fire resistance rated* construction or an *automatic sprinkler system* shall be installed throughout the building in accordance with Section 903.3.1.1 or 903.3.1.2.

Exceptions:

1. Vertical opening protection is not required for Group R 3 occupancies.
2. Vertical opening protection is not required for open parking garages.
3. Vertical opening protection for escalators shall be in accordance with Section 1103.4.5, 1103.4.6 or 1103.4.7.
4. *Exit access stairways* and *ramps* shall be in accordance with Section 1103.4.8.

1103.4.3 More than five stories. In other than Group I 2 and I 3 occupancies, interior vertical openings connecting more than five stories shall be protected by 1 hour *fire resistance rated* construction.

Exceptions:

1. Vertical opening protection is not required for Group R 3 occupancies.
2. Vertical opening protection is not required for open parking garages.
3. Vertical opening protection for escalators shall be in accordance with Section 1103.4.5, 1103.4.6 or 1103.4.7.
4. *Exit access stairways* and *ramps* shall be in accordance with Section 1103.4.8.

1103.4.4 Atriums and covered malls. In other than Group I-2 and I-3 occupancies, interior vertical openings in a covered mall building or a building with an atrium shall be protected by either 1 hour *fire resistance rated* construction or an *automatic sprinkler system* shall be installed throughout the building in accordance with Section 903.3.1.1 or 903.3.1.2.

Exceptions:

1. Vertical opening protection is not required for Group R-3 occupancies.
2. Vertical opening protection is not required for open parking garages.
3. *Exit access stairways* and *ramps* shall be in accordance with Section 1103.4.8.

1103.4.5 Escalators in Group B and M occupancies. In Group B and M occupancies, escalators creating vertical openings connecting any number of stories shall be protected by either 1 hour *fire resistance rated* construction or an *automatic*

sprinkler system in accordance with Section 903.3.1.1 installed throughout the building, with a draft curtain and closely spaced sprinklers around the escalator opening.

1103.4.6 Escalators connecting four or fewer stories. In other than Group B and M occupancies, escalators creating vertical openings connecting four or fewer stories shall be protected by either 1-hour *fire-resistance-rated* construction or an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 shall be installed throughout the building, and a draft curtain with closely spaced sprinklers shall be installed around the escalator opening.

1103.4.7 Escalators connecting more than four stories. In other than Group B and M occupancies, escalators creating vertical openings connecting five or more stories shall be protected by 1-hour *fire-resistance-rated* construction.

1103.4.8 Occupancies other than Groups I-2 and I-3. In other than Group I-2 and I-3 occupancies, floor openings containing *exit access stairways* or *ramps* that do not comply with one of the conditions listed in this section shall be protected by 1-hour *fire-resistance-rated* construction.

1. *Exit access stairways* and *ramps* that serve, or atmospherically communicate between, only two stories. Such interconnected stories shall not be open to other stories.
2. In Group R-1, R-2 or R-3 occupancies, *exit access stairways* and *ramps* connecting four stories or less serving and contained within an individual *dwelling unit* or *sleeping unit* or live/work unit.
3. *Exit access stairways* and *ramps* in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the *stairway* or *ramp*, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Group B and M occupancies, this provision is limited to openings that do not connect more than four stories.
4. *Exit access stairways* and *ramps* within an atrium complying with the provisions of Section 404 of the *International Building Code*.
5. *Exit access stairways* and *ramps* in open parking garages that serve only the parking garage.
6. *Exit access stairways* and *ramps* serving open-air seating complying with the *exit access* travel distance requirements of Section 1030.7 of the *International Building Code*.
7. *Exit access stairways* and *ramps* serving the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, places of religious worship, auditoriums and sports facilities.

1103.4.9 Waste and linen chutes. In Group I-2 occupancies, existing waste and linen chutes shall comply with Sections 1103.4.9.1 through 1103.4.9.5.

1103.4.9.1 Enclosure. Chutes shall be enclosed with 1-hour *fire-resistance-rated* construction. Opening protectives shall be in accordance with Section 716 of the *International Building Code* and have a *fire protection rating* of not less than1 hour.

1103.4.9.2 Chute intakes. Chute intakes shall comply with Section 1103.4.9.2.1 or 1103.4.9.2.2.

1103.4.9.2.1 Chute intake direct from corridor. Where intake to chutes is direct from a *corridor*, the intake opening shall be equipped with a chute intake door in accordance with Section 716 of the *International Building Code* and having a *fire protection rating* of not less than 1 hour.

1103.4.9.2.2 Chute intake via a chute intake room. Where the intake to chutes is accessed through a chute intake room, the room shall be enclosed with 1-hour *fire-resistance-rated* construction. Opening protectives for the intake room shall be in accordance with Section 716 of the *International Building Code* and have a *fire protection rating* of not less than $^{3}/_{4}$ hour. Opening protectives for the chute enclosure shall be in accordance with Section 1103.4.9.1.

1103.4.9.3 Automatic sprinkler system. Chutes shall be equipped with an *approved automatic sprinkler system* in accordance with Section 903.2.11.2.

1103.4.9.4 Chute discharge rooms. Chutes shall terminate in a dedicated chute discharge room. Such rooms shall be separated from the remainder of the building by not less than 1-hour *fire-resistance-rated* construction. Opening protectives shall be in accordance with Section 716 of the *International Building Code* and have a *fire protection rating* of not less than 1 hour.

1103.4.9.5 Chute discharge protection. Chute discharges shall be equipped with a self-closing or automatic-closing opening protective in accordance with Section 716 of the *International Building Code* and having a *fire protection rating* of not less than 1 hour.

1103.4.10 Flue-fed incinerators. Existing flue-fed incinerator rooms and associated flue shafts shall be protected with 1-hour *fire-resistance-rated* construction and shall not have other vertical openings connected with the space other than the associated flue. Opening protectives shall be in accordance with Section 716 of the *International Building Code* and have a *fire protection rating* of not less than 1 hour.

1103.5 Sprinkler systems. An *automatic sprinkler system* shall be provided in existing buildings in accordance with Sections 1103.5.1 through 1103.5.5.

1103.5.1 Group A-2. Where alcoholic beverages are consumed in a Group A-2 occupancy having an occupant load of 300 or more, the *fire area* containing the Group A-2 occupancy shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

1103.5.2 Group I-2. In Group I-2, an *automatic sprinkler system* shall be provided in accordance with Section 1105.9.

1103.5.3 Group I-2, Condition 2. In addition to the requirements of Section 1103.5.2, existing buildings of Group I-2, Condition 2 occupancy shall be equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1. The *automatic sprinkler system* shall be installed as established by the adopting ordinance. **[DATE BY WHICH SPRINKLER SYSTEM MUST BE INSTALLED].**

1103.5.4 High-rise buildings. Where Appendix M has not been adopted, existing high-rise buildings that do not have a previously *approved* fire sprinkler system shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1 where any of the following conditions apply:

1. The high-rise building has an occupied floor located more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access.
2. The high-rise building has occupied floors located more than 75 feet (22 860 mm) and not more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, and the building does not have at least two interior exit stairways complying with Section 1104.10 that are separated from the building interior by fire assemblies having a fire resistance rating of not less than 2 hours with opening protection in accordance with Table 716.1(2) of the International Building Code.
3. The high-rise building has occupied floors located more than 75 feet (22 860 mm) and not more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, and the building does not have a fire alarm system that includes smoke detection in mechanical equipment, electrical, transformer, telephone equipment and similar rooms; corridors; elevator lobbies; and at doors penetrating interior exit stairway enclosures. Building owners shall file a compliance schedule with the fire code official not later than 365 days after receipt of a written notice. The compliance schedule shall not exceed 12 years for completion of the automatic sprinkler system retrofit.

1103.5.5 Pyroxylin plastics. An *automatic sprinkler system* shall be provided throughout existing buildings where cellulose nitrate film or pyroxylin plastics are manufactured, stored or handled in quantities exceeding 100 pounds (45 kg). Vaults located within buildings for the storage of raw pyroxylin shall be protected with an *approved automatic sprinkler system* capable of discharging 1.66 gallons per minute per square foot (68 L/min/m^2) over the area of the vault.

1103.6 Standpipes. Existing structures shall be equipped with standpipes installed in accordance with Section 905 where required in Sections 1103.6.1 and 1103.6.2. The *fire code official* is authorized to approve the installation of manual standpipe systems to achieve compliance with this section where the responding fire department is capable of providing the required hose flow at the highest standpipe outlet.

1103.6.1 Existing multiple-story buildings. Existing buildings with occupied floors located more than 50 feet (15 240 mm) above the lowest level of fire department access or more than 50 feet (15 240 mm) below the highest level of fire department access shall be equipped with standpipes.

1103.6.2 Existing helistops and heliports. Existing buildings with a rooftop helistop or heliport located more than 30 feet (9144 mm) above the lowest level of fire department access to the roof level on which the helistop or heliport is located shall be equipped with standpipes in accordance with Section 2007.5.

1103.7 Fire alarm systems. An *approved* fire alarm system shall be installed in existing buildings and structures in accordance with Sections 1103.7.1 through 1103.7.6 and provide occupant notification in accordance with Section 907.5 unless other requirements are provided by other sections of this code.

Exception: Occupancies with an existing, previously *approved* fire alarm system.

1103.7.1 Group E. A fire alarm system shall be installed in existing Group E occupancies in accordance with Section 907.2.3.

Exceptions:

1. A manual fire alarm system is not required in a building with a maximum area of 1,000 square feet (93 m^2) that contains a single classroom and is located not closer than 50 feet (15 240 mm) from another building.
2. A manual fire alarm system is not required in Group E occupancies with an *occupant load* less than 50.

1103.7.2 Group I-1. An automatic fire alarm system shall be installed in existing Group I-1 facilities in accordance with Section 907.2.6.1.

Exception: Where each sleeping room has a *means of egress* door opening directly to an exterior egress balcony that leads directly to the *exits* in accordance with Section 1021, and the building is not more than three stories in height.

1103.7.3 Group I-2. In Group I-2, an automatic fire alarm system shall be installed in accordance with Section 1105.10.

1103.7.4 Group I-3. An automatic and manual fire alarm system shall be installed in existing Group I-3 occupancies in accordance with Section 907.2.6.3.

1103.7.5 Group R-1. A fire alarm system and smoke alarms shall be installed in existing Group R-1 occupancies in accordance with Sections 1103.7.5.1 through 1103.7.5.2.1.

1103.7.5.1 Group R-1 hotel and motel manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-1 hotels and motels more than one story in height or with more than 20 *sleeping units*.

Exceptions:

1. A manual fire alarm system is not required in buildings less than two stories in height where all *sleeping units*, attics and crawl spaces are separated by 1 hour *fire-resistance-rated* construction and each *sleeping unit* has direct access to a *public way*, *egress court* or yard.
2. A manual fire alarm system is not required in buildings not more than three stories in height with not more than 20 *sleeping units* and equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Manual fire alarm boxes are not required throughout the building where the following conditions are met:
    3.1. The building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
    3.2. The notification appliances will activate upon sprinkler water flow.
    3.3. Not less than one manual fire alarm box is installed at an *approved* location.

1103.7.5.1.1 Group R-1 hotel and motel automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-1 hotels and motels throughout all interior *corridors* serving sleeping rooms not equipped with an *approved*, supervised *automatic sprinkler system* installed in accordance with Section 903.

Exception: An automatic smoke detection system is not required in buildings that do not have interior *corridors* serving *sleeping units* and where each *sleeping unit* has a *means of egress* door opening directly to an *exit* or to an exterior *exit access* that leads directly to an *exit*.

1103.7.5.2 Group R-1 boarding and rooming houses manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-1 boarding and rooming houses.

Exception: Buildings less than two stories in height where all *sleeping units*, attics and crawl spaces are separated by 1 hour *fire resistance rated* construction and each *sleeping unit* has direct access to a *public way*, *egress court* or yard.

1103.7.5.2.1 Group R-1 boarding and rooming houses automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-1 boarding and rooming houses throughout all interior *corridors* serving *sleeping units* not equipped with an *approved*, supervised sprinkler system installed in accordance with Section 903.

Exception: Buildings equipped with single-station smoke alarms meeting or exceeding the requirements of Section 907.2.11.1 and where the fire alarm system includes not less than one manual fire alarm box per floor arranged to initiate the alarm.

1103.7.6 Group R-2. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-2 occupancies more than three stories in height or with more than 16 *dwelling* or *sleeping units*.

Exceptions:

1. Where each living unit is separated from other contiguous living units by *fire barriers* having a *fire resistance rating* of not less than $^{3}/_{4}$ hour, and where each living unit has either its own independent *exit* or its own independent *stairway* or *ramp* discharging at grade.
2. A separate fire alarm system is not required in buildings that are equipped throughout with an *approved* supervised *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and having a local alarm to notify all occupants.
3. A fire alarm system is not required in buildings that do not have interior *corridors* serving *dwelling units* and are protected by an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that *dwelling units* either have a *means of egress* door opening directly to an exterior *exit access* that leads directly to the *exits* or are served by open-ended *corridors* designed in accordance with Section 1027.6, Exception 3.
4. A fire alarm system is not required in buildings that do not have interior *corridors* serving *dwelling units*, do not exceed three stories in height and comply with both of the following:
    4.1. Each *dwelling unit* is separated from other contiguous *dwelling units* by *fire barriers* having a *fire resistance rating* of not less than $^{3}/_{4}$ hour.
    4.2. Each *dwelling unit* is provided with smoke alarms complying with the requirements of Section 907.2.11.

1103.8 Single- and multiple-station smoke alarms. Single- and multiple-station smoke alarms shall be installed in existing Group I-1 and R occupancies in accordance with Sections 1103.8.1 through 1103.8.3.

1103.8.1 Where required. Existing Group I-1 and R occupancies shall be provided with single-station smoke alarms in accordance with Section 907.2.11. Interconnection and power sources shall be in accordance with Sections 1103.8.2 and 1103.8.3, respectively.

Exceptions:

1. Where the code that was in effect at the time of construction required smoke alarms and smoke alarms complying with those requirements are already provided.
2. Where smoke alarms have been installed in occupancies and *dwellings* that were not required to have them at the time of construction, additional smoke alarms shall not be required provided that the existing smoke alarms comply with requirements that were in effect at the time of installation.
3. Where smoke detectors connected to a fire alarm system have been installed as a substitute for smoke alarms.

1103.8.2 Interconnection. Where more than one smoke alarm is required to be installed within an individual *dwelling* or *sleeping unit*, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. Physical interconnection of smoke alarms shall not be required where *listed* wireless alarms are installed and all alarms sound upon activation of one alarm. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

Exceptions:

1. Interconnection is not required in buildings that are not undergoing *alterations*, repairs or construction of any kind.

2. Smoke alarms in existing areas are not required to be interconnected where *alterations* or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or *basement* available that could provide access for interconnection without the removal of interior finishes.

1103.8.3 Power source. Single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exceptions:

1. Smoke alarms are permitted to be solely battery operated in existing buildings where construction is not taking place.

2. Smoke alarms are permitted to be solely battery operated in buildings that are not served from a commercial power source.

3. Smoke alarms are permitted to be solely battery operated in existing areas of buildings undergoing *alterations* or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or *basement* available that could provide access for building wiring without the removal of interior finishes.

1103.9 Carbon monoxide detection. Carbon monoxide detection shall be installed in existing Group I-1, I-2, I-4 and R occupancies and in classrooms in Group E occupancies where those units include any of the conditions identified in Sections 915.1.2 through 915.1.6. The carbon monoxide alarms shall be installed in the locations specified in Section 915.2 and the installation shall be in accordance with Section 915.4.

Exceptions:

1. Carbon monoxide alarms are permitted to be solely battery operated where the code that was in effect at the time of construction did not require carbon monoxide detectors to be provided.

2. Carbon monoxide alarms are permitted to be solely battery operated in *dwelling units* that are not served from a commercial power source.

3. A carbon monoxide detection system in accordance with Section 915.5 shall be an acceptable alternative to carbon monoxide alarms.

1103.10 Medical gases. Medical gases stored and transferred in health-care-related facilities shall be in accordance with Chapter 53.

SECTION 1104
MEANS OF EGRESS FOR EXISTING BUILDINGS

1104.1 General. *Means of egress* in existing buildings shall comply with the minimum egress requirements where specified in Table 1103.1 as further enumerated in Sections 1104.2 through 1104.25, and the building code that applied at the time of construction. Where the provisions of this chapter conflict with the building code that applied at the time of construction, the most restrictive provision shall apply. Existing buildings that were not required to comply with a building code at the time of construction shall comply with the minimum egress requirements where specified in Table 1103.1 as further enumerated in Sections 1104.2 through 1104.25.

1104.2 Elevators, escalators and moving walks. Elevators, escalators and moving walks shall not be used as a component of a required *means of egress*.

Exceptions:

1. Elevators used as an *accessible means of egress* where allowed by Section 1009.4.

2. Previously *approved* elevators, escalators and moving walks in existing buildings.

1104.3 Exit sign illumination. Exit signs shall be internally or externally illuminated. The face of an exit sign illuminated from an external source shall have an intensity of not less than 5 footcandles (54 lux). Internally illuminated signs shall provide equivalent luminance and be *listed* for the purpose.

Exception: *Approved* self-luminous signs that provide evenly illuminated letters shall have a minimum luminance of 0.06 foot-lamberts (0.21 cd/m^2).

1104.4 Power source. Where emergency illumination is required in Section 1104.5, exit signs shall be visible under emergency illumination conditions.

Exception: *Approved* signs that provide continuous illumination independent of external power sources are not required to be connected to an emergency electrical system.

1104.5 Illumination emergency power. Where *means of egress* illumination is provided, the power supply for *means of egress* illumination shall normally be provided by the premises' electrical supply. In the event of power supply failure, illumination shall be automatically provided from an emergency system for the following occupancies where such occupancies require two or more *means of egress*:

1. Group A having 50 or more occupants.

   Exception: Assembly occupancies used exclusively as a place of worship and having an *occupant load* of less than 300.

2. Group B buildings three or more stories in height, buildings with 100 or more occupants above or below a *level of exit discharge* serving the occupants or buildings with 1,000 or more total occupants.

3. Group E in interior *exit access* and *exit stairways* and *ramps*, *corridors*, windowless areas with student occupancy, shops and laboratories.

4. Group F having more than 100 occupants.

   Exception: Buildings used only during daylight hours and that are provided with windows for natural light in accordance with the *International Building Code*.

5. Group I.

6. Group M.

   Exception: Buildings less than 3,000 square feet (279 m^2) in gross sales area on one story only, excluding mezzanines.

7. Group R-1.

   Exception: Where each *sleeping unit* has direct access to the outside of the building at grade.

8. Group R-2.

   Exception: Where each *dwelling unit* or *sleeping unit* has direct access to the outside of the building at grade.

1104.5.1 Emergency power duration and installation. Emergency power for *means of egress* illumination shall be provided in accordance with Section 1203. In other than Group I-2, emergency power shall be provided for not less than 60 minutes for systems requiring emergency power.

1104.6 Guards. Guards complying with this section shall be provided at the open sides of *means of egress* that are more than 30 inches (762 mm) above the floor or grade below.

1104.6.1 Height of guards. Guards shall form a protective barrier not less than 42 inches (1067 mm) high.

Exceptions:

1. Existing guards on the open side of *stairways* shall be not less than 30 inches (760 mm) high.
2. Existing *guards* within *dwelling units* shall be not less than 36 inches (910 mm) high.
3. Existing *guards* in assembly seating areas.

1104.6.2 Opening limitations. Open *guards* shall have balusters or ornamental patterns such that a 6-inch-diameter (152 mm) sphere cannot pass through any opening up to a height of 34 inches (864 mm).

Exceptions:

1. At elevated walking surfaces for access to, and use of, electrical, mechanical or plumbing systems or equipment, *guards* shall have balusters or be of solid materials such that a sphere with a diameter of 21 inches (533 mm) cannot pass through any opening.
2. In occupancies in Group I-3, F, H or S, the clear distance between intermediate rails measured at right angles to the rails shall not exceed 21 inches (533 mm).
3. *Approved* existing open *guards*.

1104.7 Size of doors. The required capacity of each door opening shall be sufficient for the *occupant load* thereof and shall provide a minimum clear opening width of 28 inches (711 mm). Where this section requires a minimum clear opening width of 28 inches (711 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 28 inches (711 mm). The minimum clear opening height of doorways shall be 80 inches (2032 mm).

Exceptions:

1. The minimum and maximum width shall not apply to door openings that are not part of the required *means of egress* in occupancies in Group R-2 and R-3 units that are not required to be an Accessible Type A unit or Type B unit.
2. Door openings to storage closets less than 10 square feet (0.93 m^2) in area shall not be limited by the minimum clear opening width.
3. The width of door leaves in revolving doors that comply with Section 1010.3.1 shall not be limited.
4. The maximum width of door leaves in power-operated doors that comply with Section 1010.3.2 shall not be limited.
5. Door openings within a *dwelling unit* shall have a minimum clear opening height of 78 inches (1981 mm).
6. In *dwelling* and *sleeping units* that are not required to be Accessible units, Type A units or Type B units, exterior door openings, other than the required exit door, shall have a minimum clear opening height of 76 inches (1930 mm).
7. *Exit access* doors serving a room not larger than 70 square feet (6.5 m^2) shall have a minimum door leaf width of 24 inches (610 mm).
8. The minimum clear opening width shall not apply to doors for nonaccessible showers or sauna compartments.
9. The minimum clear opening width shall not apply to the doors for nonaccessible toilet stalls.
10. Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the floor.

1104.7.1 Group I-2. In Group I-2 occupancies, *means of egress* doors where used for the movement of beds shall provide a minimum clear opening width of 41½ inches (1054 mm).

Doors serving as *means of egress* doors and not used for movement of beds shall provide a minimum clear opening width of 32 inches (813 mm).

1104.7.2 Ambulatory care. In ambulatory care facilities, doors serving as *means of egress* from patient treatment rooms shall provide a minimum clear opening width of 32 inches (813 mm).

1104.8 Opening force for doors. The opening force for interior side-swinging doors without closers shall not exceed a 5-pound (22-N) force. The opening forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position. For other side-swinging, sliding and folding doors, the door latch shall release when subjected to a force of not more than 15 pounds (66 N). The door shall be set in motion when subjected to a force not exceeding 30 pounds (133 N). The door shall swing to a full-open position when subjected to a force of not more than 50 pounds (222 N). Forces shall be applied to the latch side.

1104.9 Revolving doors. Revolving doors shall comply with the following:

1. A revolving door shall not be located within 10 feet (3048 mm) of the foot or top of *stairways* or escalators. A dispersal area shall be provided between the *stairways* or escalators and the revolving doors.

2. The revolutions per minute for a revolving door shall not exceed those shown in Table 1104.9.

3. Each revolving door shall have a conforming side-hinged swinging door in the same wall as the revolving door and within 10 feet (3048 mm).

Exceptions:

1. A revolving door is permitted to be used without an adjacent swinging door for street-floor elevator lobbies provided that a *stairway*, escalator or door from other parts of the building does not discharge through the lobby and the lobby does not have any occupancy or use other than as a means of travel between elevators and a street.

2. Existing revolving doors where the number of revolving doors does not exceed the number of swinging doors within 20 feet (6096 mm).

TABLE 1104.9
REVOLVING DOOR SPEEDS

INSIDE DIAMETER (feet-inches)	POWER-DRIVEN-TYPE SPEED CONTROL (rpm)	MANUAL-TYPE SPEED CONTROL (rpm)
6-6	11	12
7-0	10	11
7-6	9	11
8-0	9	10
8-6	8	9
9-0	8	9
9-6	7	8
10-0	7	8

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

1104.9.1 Egress component. A revolving door used as a component of a *means of egress* shall comply with Section 1104.9 and all of the following conditions:

1. Revolving doors shall not be given credit for more than 50 percent of the required egress capacity.

2. Each revolving door shall be credited with not more than a 50-person capacity.

3. Revolving doors shall be capable of being collapsed when a force of not more than 130 pounds (578 N) is applied within 3 inches (76 mm) of the outer edge of a wing.

1104.10 Stair dimensions for existing stairways. Existing *stairways* in buildings shall be permitted to remain if the rise does not exceed 8¼ inches (210 mm) and the run is not less than 9 inches (229 mm). Existing *stairways* can be rebuilt.

Exception: Other *stairways approved* by the *fire code official*.

1104.10.1 Dimensions for replacement stairways. The replacement of an existing *stairway* in a structure shall not be required to comply with the new *stairway* requirements of Section 1011 where the existing space and construction will not allow a reduction in pitch or slope.

1104.11 Winders. Existing winders shall be allowed to remain in use if they have a minimum tread depth of 6 inches (152 mm) and a minimum tread depth of 9 inches (229 mm) at a point 12 inches (305 mm) from the narrowest edge.

1104.12 Curved stairways. Existing curved *stairways* shall be allowed to continue in use, provided that the minimum depth of tread is 10 inches (254 mm) and the smallest radius shall be not less than twice the width of the *stairway*.

1104.13 Stairway handrails. *Stairways* shall have *handrails* on at least one side. *Handrails* shall be located so that all portions of the *stairway* width required for egress capacity are within 44 inches (1118 mm) of a *handrail*.

Exception: *Aisle stairs* provided with a center *handrail* are not required to have additional *handrails*.

1104.13.1 Height. *Handrail* height, measured above *stair* tread nosings, shall be uniform, not less than 30 inches (762 mm) and not more than 42 inches (1067 mm).

1104.14 Slope of ramps. *Ramp* runs utilized as part of a *means of egress* shall have a running slope not steeper than 1 unit vertical in 10 units horizontal (10 percent slope). The slope of other *ramps* shall not be steeper than 1 unit vertical in 8 units horizontal (12.5 percent slope).

1104.15 Width of ramps. Existing *ramps* are permitted to have a minimum width of 30 inches (762 mm) but not less than the width required for the number of occupants served as determined by Section 1005.1. In Group I-2, *ramps* serving as a *means of egress* and used for the movement of patients in beds shall comply with Section 1105.6.4.

[BE] 1104.16 Fire escape stairways. Fire escape *stairways* shall comply with Sections 1104.16.1 through 1104.16.7.

[BE] 1104.16.1 Existing means of egress. Fire escape *stairways* shall be permitted in existing buildings but shall not constitute more than 50 percent of the required exit capacity.

[BE] 1104.16.2 Opening protectives. Doors and windows within 10 feet (3048 mm) of fire escape *stairways* shall be protected with $^{3}/_{4}$-hour opening protectives.

Exception: Opening protectives shall not be required in buildings equipped throughout with an *approved automatic sprinkler system*.

[BE] 1104.16.3 Dimensions. Fire escape *stairways* shall meet the minimum width, capacity, riser height and tread depth as specified in Section 1104.10.

[BE] 1104.16.4 Access. Access to a fire escape *stairway* from a *corridor* shall not be through an intervening room. Access to a fire escape *stairway* shall be from a door or window meeting the criteria of Section 1005.1. Access to a fire escape *stairway* shall be directly to a balcony, landing or platform. These shall not be higher than the floor or window sill level and not lower than 8 inches (203 mm) below the floor level or 18 inches (457 mm) below the window sill.

[BE] 1104.16.5 Materials and strength. Components of fire escape *stairways* shall be constructed of noncombustible materials. Fire escape *stairways* and balconies shall support the dead load plus a live load of not less than 100 pounds per square foot (4.78 kN/m^2). Fire escape *stairways* and balconies shall be provided with a top and intermediate *handrail* on each side.

[BE] 1104.16.5.1 Examination. Fire escape *stairways* and balconies shall be examined for structural adequacy and safety in accordance with Section 1104.16.5 by a *registered design professional* or others acceptable to the *fire code official* every 5 years, or as required by the *fire code official*. An inspection report shall be submitted to the *fire code official* after such examination.

[BE] 1104.16.6 Termination. The lowest balcony shall not be more than 18 feet (5486 mm) from the ground. Fire escape *stairways* shall extend to the ground or be provided with counterbalanced *stairs* reaching the ground.

Exception: For fire escape *stairways* serving 10 or fewer occupants, an *approved* fire escape ladder is allowed to serve as the termination.

[BE] 1104.16.7 Maintenance. Fire escape *stairways* shall be kept clear and unobstructed at all times and shall be maintained in good working order.

1104.17 Corridor construction. *Corridors* serving an *occupant load* greater than 30 and the openings therein shall provide an effective barrier to resist the movement of smoke. Transoms, louvers, doors and other openings shall be kept closed or be self-closing. In Group I-2, *corridors* in areas housing patient sleeping or care rooms shall comply with Section 1105.5.

Exceptions:

1. *Corridors* in occupancies other than in Group H, that are equipped throughout with an *approved automatic sprinkler system*.
2. *Corridors* in occupancies in Group E where each room utilized for instruction or assembly has not less than one-half of the required *means of egress* doors opening directly to the exterior of the building at ground level.
3. *Corridors* that are in accordance with the *International Building Code*.

1104.17.1 Corridor openings. Openings in *corridor* walls shall comply with the requirements of the *International Building Code*.

Exceptions:

1. Where 20-minute fire door assemblies are required, solid wood doors not less than 1.75 inches (44 mm) thick or insulated steel doors are allowed.
2. Openings protected with fixed wire glass set in steel frames.
3. Openings covered with 0.5-inch (12.7 mm) gypsum wallboard or 0.75-inch (19.1 mm) plywood on the room side.
4. Opening protection is not required where the building is equipped throughout with an *approved automatic sprinkler system*.

1104.18 Dead ends. Where more than one *exit* or *exit access doorway* is required, the *exit access* shall be arranged such that dead ends do not exceed the limits specified in Table 1104.18.

Exceptions:

1. 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*.
2. In existing buildings, existing dead-end *corridors* shall be permitted to comply with lengths established in Section 804.7 of the *International Existing Building Code*. Any newly constructed dead-end *corridors* within an existing building shall be limited to the lengths allowed by the *International Building Code*.

TABLE 1104.18
COMMON PATH, DEAD-END AND TRAVEL DISTANCE LIMITS (by occupancy)

OCCUPANCY	COMMON PATH OF EGRESS TRAVEL LIMIT		DEAD-END LIMIT		EGRESS ACCESS TRAVEL DISTANCE LIMIT	
	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)[i]	Unsprinklered (feet)	Sprinklered (feet)
Group A	75	20/75[i]	20[a]	20[a]	200	250[i]
Group B[h]	75[g]	100[i]	50	50	200	300[i]
Group E	75	75[i]	20	50	200	250[i]
Group F-1, S-1	75[g]	100[i]	50	50	200[e]	250[e, h, i]
Group F-2, S-2	75[g]	100[i]	50	50	300	400[i]
Group H-1	25	25[i]	0	0	75	75[i, l]
Group H-2	50	100[i]	0	0	75	100 [i, l]
Group H-3	50	100[i]	20	20	100	150[i, l]
Group H-4	75	75[i]	20	20	150	175[i, l]
Group H-5	75	75[i]	20	50	150	200[i]
Group I-1	75	75[i]	20	50	200	250[i]
Group I-2	Notes d, e, f	Notes d, e, f, j	Note e	Note e	150	200[b, j]
Group I-3	100	100[i]	NR	NR	150[b]	200[b, j]
Group I-4	NR	NR	20	20	200	250[i]
Group M	75	100[i]	50	50	200	250[i, j]
Group R-1	75	75[i, k]	50	50	200	250[i, k]

Group R-2	75	125[j, k]	50	50	200	250[j, k]
Group R-3	NR	NR	NR	NR	NR	NR
Group R-4	NR	NR	NR	NR	NR	NR
Group U	75[g]	100[j]	20	50	300	400[j]

NR = No Requirements.
For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.
a. See Section 1030.9.5 for dead-end aisles in Group A occupancies.
b. This dimension is for the total travel distance, assuming incremental portions have fully utilized their allowable maximums. For travel distance within the room, and from the room exit access door to the exit, see the appropriate occupancy chapter.
c. See Section 412 of the *International Building Code* for special requirements on spacing of doors in aircraft hangars.
d. Separation of exit access doors within a care recipient sleeping room, or any suite that includes care recipient sleeping rooms, shall comply with Section 1105.5.6.
e. In smoke compartments containing care recipient sleeping rooms and treatment rooms, dead-end corridors shall comply with Section 1105.6.5.
f. In Group I-2, Condition 2, care recipient sleeping rooms or any suite that includes care recipient sleeping rooms shall comply with Section 1105.7.
g. Where a tenant space in Group B, S and U occupancies has an occupant load of not more than 30, the length of a common path of egress travel shall be not more than 100 feet.
h. Where the building, or portion of the building, is limited to one story and the height from the finished floor to the bottom of the ceiling or roof slab or deck is 24 feet or more, the exit access travel distance is increased to 400 feet.
i. For covered and open malls, the exit access travel distance is increased to 400 feet.
j. Buildings equipped with an approved automatic sprinkler system in accordance with Section 903.3.1.1.
k. Buildings equipped with an approved automatic sprinkler system in accordance with Section 903.3.1.2.
l. Group H occupancies equipped with an approved automatic sprinkler system in accordance with Section 903.2.5.

1104.19 Exit access travel distance. *Exits* shall be located so that the maximum length of *exit access* travel, measured from the most remote point to an *approved exit* along the natural and unobstructed path of egress travel, does not exceed the distances given in Table 1104.18.

1104.20 Common path of egress travel. The *common path of egress travel* shall not exceed the distances given in Table 1104.18.

1104.21 Stairway discharge identification. An interior *exit stairway* or *ramp* that continues below its *level of exit discharge* shall be arranged and marked to make the direction of egress to a *public way* readily identifiable.

Exception: *Stairways* that continue one half story beyond their *levels of exit discharge* need not be provided with barriers where the *exit discharge* is obvious.

1104.22 Exterior stairway protection. *Exterior exit stairways* shall be separated from the interior of the building as required in Section 1027.6. Openings shall be limited to those necessary for egress from normally occupied spaces.

Exceptions:

1. Separation from the interior of the building is not required for buildings that are two stories or less above grade where the *level of exit discharge* serving such occupancies is the first story above grade.
2. Separation from the interior of the building is not required where the exterior *stairway* is served by an exterior balcony that connects two remote exterior *stairways* or other *approved exits*, with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be not less than 50 percent of the height of the enclosing wall, with the top of the opening not less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior *stairway* located in a building or structure that is permitted to have unenclosed interior *stairways* in accordance with Section 1023.
4. Separation from the *open-ended corridors* of the building is not required for exterior *stairways* provided that:
   4.1. The *open-ended corridors* comply with Section 1020.
   4.2. The *open-ended corridors* are connected on each end to an *exterior exit stairway* complying with Section 1027.

4.3. At any location in an *open-ended corridor* where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet (3 m^2) or an exterior *stairway* shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

1104.23 Minimum aisle width. The minimum clear width of *aisles* shall comply with the following:

1. Forty-two inches (1067 mm) for stepped aisles having seating on each side.

   Exception: Thirty-six inches (914 mm) where the stepped *aisle* serves fewer than 50 seats.

2. Thirty-six inches (914 mm) for stepped *aisles* having seating on only one side.

   Exceptions:

   1. Thirty inches (760 mm) for catchment areas serving not more than 60 seats.
   2. Twenty-three inches (584 mm) between a stepped aisle *handrail* and seating where a stepped *aisle* does not serve more than five rows on one side.

3. Twenty inches (508 mm) between a stepped *aisle handrail* or guard and seating where the *aisle* is subdivided by a mid-aisle *handrail*.

4. Forty-two inches (1067 mm) for level or ramped *aisles* having seating on both sides.

   Exceptions:

   1. Thirty-six inches (914 mm) where the *aisle* serves fewer than 50 seats.
   2. Thirty inches (760 mm) where the *aisle* serves fewer than 15 seats and does not serve as part of an *accessible route*.

5. Thirty-six inches (914 mm) for level or ramped *aisles* having seating on only one side.

   Exception: Thirty inches (760 mm) for catchment areas serving not more than 60 seats and not serving as part of an *accessible route*.

6. In Group I-2, where *aisles* are used for movement of patients in beds, *aisles* shall comply with Section 1105.6.8.

1104.24 Stairway floor number signs. Existing *stairways* shall be marked in accordance with Section 1023.9.

1104.25 Egress path markings. Existing high-rise buildings of Group A, B, E, I, M and R-1 occupancies shall be provided with luminous *egress* path markings in accordance with Section 1025.

Exception: Open, unenclosed stairwells in historic buildings designated as historic under a state or local historic preservation program.

SECTION 1105
CONSTRUCTION REQUIREMENTS FOR EXISTING GROUP I-2

1105.1 General. Existing Group I-2 shall meet all of the following requirements:

1. The minimum fire safety requirements in Section 1103.
2. The minimum *means of egress* requirements in Section 1104.
3. The additional egress and construction requirements in Section 1105.

Where the provisions of this chapter conflict with the construction requirements that applied at the time of construction, the most restrictive provision shall apply.

1105.2 Applicability. The provisions of Sections 1105.3 through 1105.8, 1105.10 and 1105.11 shall apply to the existing Group I-2 *fire area*.

1105.3 Construction. Group I-2, Condition 2 shall not be located on a floor level higher than the floor level limitation in Table 1105.3 based on the type of construction.

TABLE 1105.3
FLOOR LEVEL LIMITATIONS FOR GROUP I-2, CONDITION 2

CONSTRUCTION TYPE	AUTOMATIC SPRINKLER SYSTEM	ALLOWABLE FLOOR LEVEL*			
		1	2	3	4 or more
IA	Note b	P	P	P	P
	Note c	P	P	P	P
IB	Note b	P	P	P	P
	Note c	P	P	P	P
IIA	Note b	P	P	P	NP
	Note c	P	NP	NP	NP
IIB	Note b	P	P	NP	NP
	Note c	NP	NP	NP	NP
IIIA	Note b	P	P	NP	NP
	Note c	P	NP	NP	NP
IIIB	Note b	P	NP	NP	NP
	Note c	NP	NP	NP	NP
IV	Note b	P	P	NP	NP
	Note c	NP	NP	NP	NP
VA	Note b	P	P	NP	NP
	Note c	NP	NP	NP	NP
VB	Note b	P	NP	NP	NP
	Note c	NP	NP	NP	NP

P = Permitted; NP = Not Permitted.
a. Floor level shall be counted based on the number of stories above grade.
b. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
c. The building is equipped with an automatic sprinkler system in accordance with Section 1105.8.

1105.4 Incidental uses in existing Group I-2. Incidental uses associated with and located within existing single-occupancy or mixed-occupancy Group I-2 buildings and that generally pose a greater level of risk to such occupancies shall comply with the provisions of Sections 1105.4.1 through 1105.4.3.2.1. Incidental uses in Group I-2 occupancies are limited to those listed in Table 1105.4.

TABLE 1105.4
INCIDENTAL USES IN EXISTING GROUP I-2 OCCUPANCIES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen fuel gas rooms, not classified as Group H	2 hours

Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops not classified as Group H	2 hours; or 1 hour and provide automatic sprinkler system
Laboratories and vocational shops, not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
Patient rooms equipped with padded surfaces	1 hour or provide automatic sprinkler system
Physical plant maintenance shops	1 hour or provide automatic sprinkler system
Waste and linen collection rooms with containers with total volume of 10 cubic feet or greater	1 hour or provide automatic sprinkler system
Storage rooms greater than 100 square feet	1 hour or provide automatic sprinkler system
Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons for flooded lead-acid, nickel cadmium or VRLA, or more than 1,000 pounds for lithium-ion and lithium metal polymer used for facility standby power, emergency power or uninterruptable power supplies	2 hours

For SI: 1 square foot = 0.0929 m², 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L.

1105.4.1 Occupancy classification. Incidental uses shall not be individually classified in accordance with Section 302.1 of the *International Building Code*. Incidental uses shall be included in the building occupancies within which they are located.

1105.4.2 Area limitations. Incidental uses shall not occupy more than 10 percent of the *building area* of the story in which they are located.

1105.4.3 Separation and protection. The incidental uses listed in Table 1105.4 shall be separated from the remainder of the building or equipped with an *automatic sprinkler system*, or both, in accordance with the provisions of that table.

1105.4.3.1 Separation. Where Table 1105.4 specifies a *fire resistance rated* separation, the incidental uses shall be separated from the remainder of the building in accordance with Section 509.4.1 of the *International Building Code*.

1105.4.3.2 Protection. Where Table 1105.4 permits an *automatic sprinkler system* without a *fire resistance rated* separation, the incidental uses shall be separated from the remainder of the building by construction capable of resisting the passage of smoke in accordance with Section 509.4.2 of the *International Building Code*.

1105.4.3.2.1 Protection limitation. Except as otherwise specified in Table 1105.4 for certain incidental uses, where an *automatic sprinkler system* is provided in accordance with Table 1105.4, only the space occupied by the incidental use need be equipped with such a system.

1105.5 Corridor construction. In Group I-2, in areas housing patient sleeping or care rooms, *corridor* walls and the opening protectives therein shall provide a barrier designed to resist the passage of smoke in accordance with Sections 1105.5.1 through 1105.5.7.

1105.5.1 Materials. The walls shall be of materials permitted by the building type of construction.

1105.5.2 Fire-resistance rating. Unless required elsewhere in this code, *corridor* walls are not required to have a *fire resistance rating*. *Corridor* walls that were installed as *fire resistance rated* assemblies in accordance with the applicable codes under which the building was constructed, remodeled or altered shall be maintained unless modified in accordance with the *International Existing Building Code*.

1105.5.3 Corridor wall continuity. *Corridor* walls shall extend from the top of the foundation or floor below to one of the following:

1. The underside of the floor or roof sheathing, deck or slab above.

2. The underside of a ceiling above where the ceiling membrane is constructed to limit the passage of smoke.

3. The underside of a lay-in ceiling system where the ceiling system is constructed to limit the passage of smoke and where the ceiling tiles weigh not less than 1 pound per square foot (4.88 kg/m^2) of tile.

1105.5.4 Openings in corridor walls. Openings in *corridor* walls shall provide protection in accordance with Sections 1105.5.4.1 through 1105.5.4.3.

1105.5.4.1 Windows. Windows in *corridor* walls shall be sealed to limit the passage of smoke, or the window shall be automatic-closing upon detection of smoke, or the window opening shall be protected by an automatic-closing device that closes upon detection of smoke.

Exception: In *smoke compartments* not containing patient sleeping rooms, pass-through windows or similar openings shall be permitted in accordance with Section 1105.5.4.3.

1105.5.4.2 Doors. Doors in *corridor* walls shall comply with Sections 1105.5.4.2.1 through 1105.5.4.2.3.

1105.5.4.2.1 Louvers. Doors in *corridor* walls shall not include louvers, transfer grills or similar openings.

Exception: Doors shall be permitted to have louvers, transfer grills or similar openings at toilet rooms or bathrooms; storage rooms that do not contain storage of flammable or combustible material; and storage rooms that are not required to be separated as incidental uses.

1105.5.4.2.2 Corridor doors. Doors in *corridor* walls shall limit the transfer of smoke by complying with the following:

1. Doors shall be constructed of not less than 1$^3/_4$-inch-thick (44 mm) solid bonded core wood or capable of resisting fire not less than $^1/_3$ hour.

Exception: *Corridor* doors in buildings equipped throughout with an *automatic sprinkler system*.

2. Frames for side-hinged swinging doors shall have stops on the sides and top to limit transfer of smoke.

3. Where provided, vision panels in doors shall be a fixed glass window assembly installed to limit the passage of smoke. Existing wired glass panels with steel frames shall be permitted to remain in place.

4. The clearance between the bottom of the door and floor shall not exceed 1 inch (25 mm).

5. Doors shall be positive latching with devices that resist not less than 5 pounds (22.2 N). Roller latches are prohibited.

6. Mail slots or similar openings shall be permitted in accordance with Section 1105.5.4.3.

1105.5.4.2.3 Dutch doors. Where provided, Dutch doors shall comply with Section 1105.5.4.2.2. In addition, Dutch doors shall be equipped with latching devices on either the top or bottom leaf to allow leaves to latch together. The space between the leaves shall be protected with devices such as astragals to limit the passage of smoke.

1105.5.4.2.4 Self- or automatic-closing doors. Where self- or automatic-closing doors are required, closers shall be maintained in operational condition. Hold-open devices on doors shall be capable of manual release.

1105.5.4.2.5 Protective plates. Protective plates installed on *corridor* doors shall not be limited in size.

1105.5.4.3 Openings in corridor walls and doors. In other than *smoke compartments* containing patient sleeping rooms, mail slots, pass-through windows or similar openings shall not be required to be protected where the aggregate area of the openings between the *corridor* and a room are not greater than 80 square inches (51 613 mm^2) and are located with the top edge of any opening not higher than 48 inches above the floor.

1105.5.5 Penetrations. The space around penetrating items shall be filled with an *approved* material to limit the passage of smoke.

1105.5.6 Joints. Joints shall be filled with an *approved* material to limit the passage of smoke.

1105.5.7 Ducts and air transfer openings. The space around a duct penetrating a smoke partition shall be filled with an *approved* material to limit the passage of smoke. Air transfer openings in smoke partitions shall be provided with a smoke damper complying with Section 717.3.2.2 of the *International Building Code*.

Exception: Where the installation of a smoke damper will interfere with the operation of a required smoke control system in accordance with Section 909, *approved* alternative protection shall be utilized.

1105.6 Means of egress. In addition to the *means of egress* requirements in Section 1104, Group I-2 facilities shall meet the *means of egress* requirements in Sections 1105.6.1 through 1105.6.8.

1105.6.1 Two means of egress. A *means of egress* shall be provided from each *smoke compartment* created by *smoke barriers* without having to return through the *smoke compartment* from which the *means of egress* originated. *Smoke compartments* that do not contain an *exit* shall be provided with direct access to not less than two adjacent *smoke compartments*.

1105.6.2 Size of door. *Means of egress* doors used for the movement of patients in beds shall provide a minimum clear width of 41 1/2 inches (1054 mm). The height of the door opening shall be not less than 80 inches (2032 mm).

Exceptions:

1. Door closers and door stops shall be permitted to be 78 inches (1981 mm) minimum above the floor.
2. In Group I-2, Condition 1, existing *means of egress* doors used for the movement of patients in beds that provide a minimum clear width of 32 inches (813 mm) shall be permitted to remain.

1105.6.3 Group I-2 occupancies. In Group I-2, where a door serves as an opening protective in a *fire barrier*, *smoke barrier* or *fire wall* and where the door is equipped with a hold-open device, such door shall automatically close upon any of the following conditions:

1. Actuation of smoke detectors initiating the hold-open device.
2. Activation of the fire alarm system within the zone.
3. Activation of an *automatic sprinkler system* within the zone.

1105.6.4 Ramps. In areas where *ramps* are used for movement of patients in beds, the clear width of the *ramp* shall be not less than 48 inches (1219 mm).

1105.6.5 Corridor width. In areas where *corridors* are used for movement of patients in beds, the clear width of the *corridor* shall be not less than 48 inches (1219 mm).

1105.6.6 Dead-end corridors. In *smoke compartments* containing patient sleeping rooms and treatment rooms, dead-end *corridors* shall not exceed 30 feet (9144 mm) unless *approved* by the *fire code official*.

1105.6.7 Separation of exit access doors. Patient sleeping rooms, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (92.9 m^2) shall have not less than two *exit access* doors placed a distance apart equal to not less than one-third of the length of the maximum overall diagonal dimension of the patient sleeping room or suite to be served, measured in a straight line between *exit access* doors.

1105.6.8 Aisles. In areas where *aisles* are used for movement of patients in beds, the clear width of the *aisle* shall be not less than 48 inches (1219 mm).

1105.7 Smoke compartments. *Smoke compartments* shall be provided in existing Group I-2, Condition 2, in accordance with Sections 1105.7.1 through 1105.7.6.

1105.7.1 Design. *Smoke barriers* shall be provided to subdivide each story used for patients sleeping with an *occupant load* of more than 30 patients into not fewer than two *smoke compartments*.

1105.7.1.1 Refuge areas. Refuge areas shall be provided within each *smoke compartment*. The size of the refuge area shall accommodate the occupants and care recipients from the adjoining *smoke compartment*. Where a *smoke compartment* is adjoined by two or more *smoke compartments*, the minimum area of the refuge area shall accommodate the largest *occupant load* of the adjoining compartments.

The size of the refuge area shall provide the following:

1. Not less than 30 net square feet (2.8 m^2) for each care recipient confined to a bed or stretcher.
2. Not less than 15 square feet (1.4 m^2) for each resident in a Group I-2 using mobility assistance devices.

3. Not less than 6 square feet (0.56 m^2) for each occupant not addressed in Items 1 and 2.

Areas of spaces permitted to be included in the calculation of the refuge area are *corridors*, sleeping areas, treatment rooms, lounge or dining areas and other low-hazard areas.

1105.7.2 Smoke barriers. *Smoke barriers* shall be constructed in accordance with Section 709 of the *International Building Code*.

Exceptions:

1. Existing *smoke barriers* are permitted to remain where the existing *smoke barrier* has a minimum *fire resistance rating* of ½ hour.

2. *Smoke barriers* shall be permitted to terminate at an atrium enclosure in accordance with Section 404.6 of the *International Building Code*.

1105.7.3 Opening protectives. Openings in *smoke barriers* shall be protected in accordance with Section 716 of the *International Building Code*. Opening protectives shall have a minimum *fire protection rating* of ⅓ hour.

Exceptions:

1. Existing wired glass vision panels in doors shall be permitted to remain.

2. Existing nonlabeled protection plates shall be permitted to remain.

1105.7.4 Penetrations. Penetrations of *smoke barriers* shall comply with the *International Building Code*.

Exception: *Approved* existing materials and methods of construction.

1105.7.5 Joints. Joints made in or between *smoke barriers* shall comply with the *International Building Code*.

Exception: *Approved* existing materials and methods of construction.

1105.7.6 Duct and air transfer openings. Penetrations in a *smoke barrier* by duct and air transfer openings shall comply with Section 717 of the *International Building Code*.

Exception: Where existing duct and air transfer openings in *smoke barriers* exist without smoke dampers, they shall be permitted to remain. Any changes to existing smoke dampers shall be submitted for review and *approved* in accordance with Section 717 of the *International Building Code*.

1105.8 Group I-2 care suites. Care suites in existing Group I-2, Condition 2 occupancies shall comply with Sections 407.4.4 through 407.4.4.6.2 of the *International Building Code*.

1105.9 Group I-2 automatic sprinkler system. An *automatic sprinkler system* installed in accordance with Section 903.3.1.1 shall be provided throughout the floor containing the Group I-2 *fire area*. The sprinkler system shall be provided throughout the floor where the Group I-2 occupancy is located, on all floors between the Group I-2 occupancy *fire area* and the *level of exit discharge*, the *level of exit discharge*, and all floors below the *level of exit discharge*.

Exception: Floors classified as an open parking garage are not required to be sprinklered.

1105.10 Group I-2 automatic fire alarm system. An automatic fire alarm system shall be installed in existing Group I-2 occupancies in accordance with Section 907.2.6.2.

Exception: Manual fire alarm boxes in patient sleeping areas shall not be required at *exits* if located at all nurses' control stations or other constantly attended staff locations, provided such that manual fire alarm boxes are visible, are provided with *ready access*, and travel distances required in Section 907.4.2.1 are not exceeded.

1105.11 Essential electrical systems. Essential electrical systems in Group I-2, Condition 2 occupancies shall be in accordance with Sections 1105.11.1 and 1105.11.2.

1105.11.1 Where required. Where required by NFPA 99, Group I-2, Condition 2 occupancies shall be provided with an essential electrical system in accordance with NFPA 99.

1105.11.2 Installation and duration. In Group I-2, Condition 2 occupancies, the installation and duration of operation of existing essential electrical systems shall be based on a hazard vulnerability analysis conducted in accordance with NFPA 99.

SECTION 1106
REQUIREMENTS FOR OUTDOOR OPERATIONS

1106.1 Tire storage yards. Existing tire storage yards shall be provided with fire apparatus access roads in accordance with Sections 1106.1.1 and 1106.1.2.

1106.1.1 Access to piles. Access roadways shall be within 150 feet (45 720 mm) of any point in the storage yard where storage piles are located not less than 20 feet (6096 mm) from any storage pile.

1106.1.2 Location within piles. Fire apparatus access roads shall be located within all pile clearances identified in Section 3405.4 and within all fire breaks required in Section 3405.5.

CHAPTER 12
ENERGY SYSTEMS

User note:

About this chapter: *Chapter 12 was added to address the current energy systems found in this code, and is provided for the introduction of a wide range of systems to generate and store energy in, on and adjacent to buildings and facilities. The expansion of such energy systems is related to meeting today's energy, environmental and economic challenges. Ensuring appropriate criteria to address the safety of such systems in building and fire codes is an important part of protecting the public at large, building occupants and emergency responders. More specifically, this chapter addresses standby and emergency power, portable generators, photovoltaic systems, fuel cell energy systems, and energy storage systems.*

SECTION 1207
ELECTRICAL ENERGY STORAGE SYSTEMS (ESS)

1207.3.6 Repairs. Repairs of ESS shall only be done by qualified personnel as defined by NFPA 70. Repairs with other than identical parts shall be considered retrofitting and comply with Section 1207.3.7. Repairs shall be documented in the service records log.

1207.5.3 Elevation. Electrochemical ESS shall not be located in the following areas:

1. Where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.
2. Where the floor is located below the lowest *level of exit discharge*.

Exceptions:

1. Lead-acid and nickel-cadmium battery systems less than 50 VAC and 60 VDC installed in facilities under the exclusive control of communications utilities in accordance with NFPA 76.
2. Where *approved*, installations shall be permitted in underground vaults complying with NFPA 70, Article 450, Part III.
3. Where *approved* by the *fire code official*, installations shall be permitted on higher and lower floors.

1207.11.6 Fire detection. Rooms and areas within *dwellings units*, *sleeping units* and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section 907.2.10. An *approved* heat alarm ~~*heat detector listed* and~~ interconnected to the smoke alarms shall be installed in locations within *dwelling units*, *sleeping units* and attached garages where smoke alarms cannot be installed based on their listing.

Part IV—Special Occupancies and Operations

CHAPTER 20
AVIATION FACILITIES

~~**User note:**~~

~~***About this chapter**: Chapter 20 specifies minimum requirements for the fire-safe operation of airports, heliports and helistops. The principal nonflight operational hazards associated with aviation involve fuel, facilities and operations. Therefore, safe use of flammable and combustible liquids during fueling and maintenance operations is emphasized. Availability of portable Class B:C-rated fire extinguishers for prompt control or suppression of incipient fires is required.*~~

SECTION 2003
GENERAL PRECAUTIONS

2003.8 Posted information. Information required to be posted by Sections 2003.8.1 and 2003.8.2 shall be posted on an *approved* sign.

2003.8.1 Allowable wing height. Where unit heaters are provided in accordance with Exception 1 of Section 412.3.4 of the *International Building Code*, the maximum wing height shall be posted.

2003.8.2 Allowable fuel capacity. The maximum allowable fuel quantity for a hangar shall be posted. Where multiple hangars are located within a fire area, the maximum allowable fuel quantity for the fire area will be posted in each hanger.

2003.8.3 Location. Information required to be posted by Sections 2003.8.1 and 2003.8.2 shall be located on the interior side and adjacent to the door provided for the aircraft entrance.

SECTION 2007
HELISTOPS AND HELIPORTS

2007.6 Foam protection. Foam fire-protection capabilities shall be provided for rooftop heliports in accordance with NPFA 418. Such systems shall be designed, installed and maintained in accordance with the applicable provisions of Sections 903, 904 and 905.

CHAPTER 21
DRY CLEANING

~~**User note:**~~

~~***About this chapter:** Chapter 21 provides provisions that are intended to reduce hazards associated with use of flammable and combustible dry cleaning solvents. These materials, like all volatile organic chemicals, generate significant quantities of static electricity and are thus readily ignitable. Many flammable and nonflammable dry cleaning solvents also possess health hazards when involved in a fire.*~~

CHAPTER 22
COMBUSTIBLE DUST-PRODUCING OPERATIONS

~~**User note:**~~

~~***About this chapter:*** *Chapter 22 provides requirements that seek to reduce the likelihood of dust explosions by managing the hazards of ignitable suspensions of combustible dusts associated with a variety of operations including woodworking, mining, food processing, agricultural commodity storage and handling and pharmaceutical manufacturing, among others. This chapter provides various requirements to control ignition sources, use properly listed and designed dust collection systems, maintain good housekeeping practices and provide proper training to those involved in these processes. Appropriate standards are referenced to deal with the specific dust hazards.*~~

SECTION 2203
DUST EXPLOSION PREVENTION

2203.4.5 Powered industrial trucks. Powered industrial trucks used in electrically classified areas shall be *listed* for such use and also comply with NFPA 505.

SECTION 2205
STANDARDS

2205.1 Specific hazards standards. The *fire code official* is authorized to enforce additional industry- or material-specific provisions of the codes and standards listed in Table 2205.1 to prevent and control dust explosions, as applicable.

TABLE 2205.1
EXPLOSION PROTECTION STANDARDS

STANDARD	SUBJECT
NFPA 61	Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities
NFPA 68	Standard on Explosion Protection by Deflagration Venting
NFPA 69	Standard on Explosion Prevention Systems
NFPA 70	National Electrical Code
NFPA 77	Recommended Practice on Static Electricity
NFPA 85	Boiler and Combustion System Hazards Code
NFPA 120	Standard for Fire Prevention and Control in Coal Mines
NFPA 484	Standard for Combustible Metals
NFPA 505	Fire Safety Standard for Powered Industrial Trucks, Including Type Designations, Areas of Use, Maintenance and Operation
NFPA 654	Standard for Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids
NFPA 655	Standard for the Prevention of Sulfur Fires and Explosions

NFPA 664	Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities

2205.1.1 Dust hazard analysis. If a dust hazard analysis (DHA) is required by the *fire code official* for new or existing

CHAPTER 23
MOTOR FUEL-DISPENSING FACILITIES AND REPAIR GARAGES

~~**User note:**~~

~~***About this chapter:*** *Chapter 23 sets forth regulations for motor fuel-dispensing stations and repair garages. It addresses both liquid and gaseous motor fuels associated with automotive, marine, aircraft and fleet vehicle motor fuel-dispensing facilities. The repair garage provisions specifically address hazards associated with the different types of fuel used, including flammable and combustible liquids, hydrogen, LPG, LNG and CNG.*

SECTION 2301
GENERAL

SECTION 2303
LOCATION OF DISPENSING DEVICES

2303.2.1 Height. The height of the emergency disconnect switch shall be not less than 42 inches (1067 mm) and not more than 48 inches (1219 mm) measured vertically, from the floor level to the activating button.

SECTION 2306
FLAMMABLE AND COMBUSTIBLE LIQUID MOTOR FUEL-DISPENSING FACILITIES

2306.2.3 Above-ground tanks located outdoors, above grade. Above-ground tanks shall not be used for the storage of Class I, II or III liquid motor fuels, except as provided by this section.

1. Above-ground tanks used for outdoor, above-grade storage of Class I liquids shall be *listed* and *labeled* as protected above-ground tanks in accordance with UL 2085 and shall be in accordance with Chapter 57. Such tanks shall be located in accordance with Table 2306.2.3.
2. Above-ground tanks used for outdoor, above-grade storage of Class II or IIIA liquids shall be *listed* and *labeled* as protected above-ground tanks in accordance with UL 2085 and shall be installed in accordance with Chapter 57. Tank locations shall be in accordance with Table 2306.2.3.

   Exception: Other above-ground tanks that comply with Chapter 57 where *approved* by the *fire code official*.
3. Tanks containing fuels shall not exceed 12,000 gallons (45 420 L) in individual capacity or 48,000 gallons (181 680 L) in aggregate capacity. Installations with the maximum allowable aggregate capacity shall be separated from other such installations by not less than 100 feet (30 480 mm).
4. Tanks located at farms, construction projects or rural areas shall comply with Section 5706.2.
5. Above-ground tanks used for outdoor, above-grade storage of Class IIIB liquid motor fuel shall be *listed* and *labeled* in accordance with UL 142 or *listed* and *labeled* as protected above-ground tanks in accordance with UL 2085 and shall be installed in accordance with Chapter 57. Tank locations shall be in accordance with Table 2306.2.3.
6. Above-ground tanks used for outdoor, above-grade storage of Class I liquid motor fuels at a *fleet vehicle motor fuel-dispensing facility* shall be limited to a maximum individual capacity of 1,100 gallons if *listed* and *labeled* in accordance with UL 142. Tank locations shall be in accordance with Table 2306.2.3. Secondary containment shall be provided in accordance with Section 2306.5

2306.2.3.1 Kerosene storage. The provisions of Section 2306.1 shall not prohibit above-ground tanks and dispensers for K-1 kerosene when the following conditions are met:

1. The maximum individual and aggregate tank capacity shall be 660 gallons (2498 L).

   Exception: Individual and aggregate tank capacities up to a maximum of 1,000 gallons (3785 L) where tanks are installed in vaults that comply with Section 5704.2.8.

2. Only listed UL 142 tanks with spill control in accordance with NFPA 30 shall be used.

   Exception: Listed secondary containment type tanks provided that:
   (a) An internal emergency shear valve is installed whenever piping connections are made below the liquid level of the tank; and
   (b) Where the interstitial space is enclosed, emergency venting is installed in accordance with NFPA 30.

3. Normal tank venting shall be provided in accordance with Chapter 57.
4. Tanks shall be equipped with emergency venting that will not permit pressures to exceed 2.5 psig (17.2 kPa).
5. Pumps and dispenser shall be listed.
6. Electrical equipment shall comply with Section 5703.1.
7. Vehicle impact protection shall be provided in accordance with Section 2306.4.
8. Dispensing devices shall be located at 20 feet (6096 mm) from any dispenser of vehicle fuels, LPG, LNG, or CNG.
9. Tanks and dispensers shall be located at least 5 feet (1524 mm) from buildings on the same lot.
10. Tanks and dispensers shall be located at least 20 feet (6096 mm) from the nearest side of a public way, and at least 20 feet (6096 mm) from any lot line including the opposite side of a public way.
11. Dispensing devices shall be located such that when the hose is fully extended, the nozzle shall not reach within 5 feet (1524 mm) of any building opening.
12. Dispensers shall be visible from the attendant's station. Mirrors or video cameras utilized to achieve compliance with this item shall be approved by the code official.
13. Only approved containers shall be filled from these tanks and dispensers. Vehicles shall not be fueled from them.
14. Portable fire extinguishers shall be provided in accordance with Section 2305.5.

SECTION 2307
LIQUEFIED PETROLEUM GAS MOTOR FUEL-DISPENSING FACILITIES

2307.1 General. Motor fuel-dispensing facilities for liquefied petroleum gas (LP-gas) fuel shall be in accordance with this section and Chapter 61.

Exception: Facilities licensed by the ~~A license is required by the~~ North Carolina Department of Agriculture. The license shall be readily available upon request.

CHAPTER 24
FLAMMABLE FINISHES

~~**User note:**~~

~~***About this chapter:*** *Chapter 24 provides requirements that govern operations where flammable or combustible finishes are applied by spraying, dipping, powder coating or flow-coating processes. As with all operations involving flammable or combustible liquids and combustible dusts or vapors, controlling ignition sources and methods of reducing or controlling flammable vapors or combustible dusts at or near these operations are emphasized.*~~

CHAPTER 25
FRUIT AND CROP RIPENING

User note:

About this chapter: *Chapter 25 provides guidance that is intended to reduce the likelihood of explosions resulting from improper use or handling of ethylene gas used for crop ripening and coloring processes. This is accomplished by regulating ethylene gas generation, regulating storage and distribution systems and controlling ignition sources. Design and construction of facilities for fruit and crop ripening are regulated by the* International Building Code® *to reduce the impact of potential accidents to people and buildings.*

CHAPTER 26
FUMIGATION AND INSECTICIDAL FOGGING

User note:

About this chapter: *Chapter 26 regulates fumigation and insecticidal fogging operations that use toxic pesticide chemicals to kill insects, rodents and other vermin. Fumigants and insecticidal fogging agents pose little hazard if properly applied; however, the inherent toxicity of all these agents and the potential flammability of some make special precautions necessary when they are used. Requirements of this chapter are intended to protect both the public and fire fighters from hazards associated with these products.*

CHAPTER 27
SEMICONDUCTOR FABRICATION FACILITIES

User note:

About this chapter: *Chapter 27 provides requirements that are intended to control hazards associated with the manufacture of electrical circuit boards or microchips, commonly called semiconductors. Though the finished product possesses no unusual hazards, materials commonly associated with semiconductor manufacturing are often quite hazardous and include flammable liquids, pyrophoric and flammable gases, toxic substances and corrosives. The requirements of this chapter are concerned with both life safety and property protection. However, the fire code official should recognize that the risk of extraordinary property damages is far more common than the risk of personal injuries from fire. Section 415.11 of the* International Building Code® *also addresses these facilities that are classified as Group H-5 occupancies.*

CHAPTER 28
LUMBER YARDS AND AGRO-INDUSTRIAL, SOLID BIOMASS AND WOODWORKING FACILITIES

User note:

About this chapter: *Chapter 28 provides requirements that are intended to prevent fires and explosions, facilitate fire control and reduce exposures to and from facilities storing, selling or processing wood and forest products, including sawdust, wood chips, shavings, bark mulch, shorts, finished planks, sheets, posts, poles, timber and raw logs and the hazard they represent once ignited. Also included are solid biomass feedstock and raw products associated with agro-industrial facilities and the outdoor storage of pallets at pallet manufacturing and recycling facilities. This chapter requires active and passive fire protection features to reduce on- and off-site exposures, limit fire size and development and facilitate fire fighting by employees and the fire service.*

SECTION 2804
FIRE PROTECTION

2804.4 Automatic sprinkler systems. *Automatic sprinkler systems*, where required, shall be installed in accordance with Section 903.3.1.1.

CHAPTER 29
MANUFACTURE OF ORGANIC COATINGS

~~**User note:**~~

~~***About this chapter:*** *Chapter 29 regulates materials and processes associated with the manufacture of paints as well as bituminous, asphaltic and other diverse compounds formulated to protect buildings, machines and objects from the effects of weather, corrosion and hostile environmental exposures. Paint for decorative, architectural and industrial uses comprises the bulk of organic coating production. Painting and processes related to the manufacture of nonflammable and noncombustible or water-based products are exempt from the provisions of this chapter. The application of organic coatings is covered by Chapter 24. Elimination of ignition sources, maintenance of fire protection equipment and isolation or segregation of hazardous operations are emphasized.*

CHAPTER 30
INDUSTRIAL OVENS

~~**User note:**~~

~~***About this chapter:*** *Chapter 30 addresses the fuel supply, ventilation, emergency shutdown equipment, fire protection and the operation and maintenance of industrial ovens, which are sometimes referred to as industrial heat enclosures or industrial furnaces. Compliance with this chapter is intended to reduce the likelihood of fires involving industrial ovens, which are usually the result of the fuel in use or volatile vapors given off by the materials being heated, or to manage the impact if a fire should occur.*

CHAPTER 31
TENTS, TEMPORARY SPECIAL EVENT STRUCTURES AND OTHER MEMBRANE STRUCTURES

~~**User note:**~~

~~***About this chapter:*** *Chapter 31 provides requirements that are intended to protect temporary as well as permanent tents and air-supported and other membrane structures and temporary stage special event structures from fire and similar hazards. The provisions regulate structure location and access, anchorage, egress, heat-producing equipment, hazardous materials and operations, combustible vegetation, ignition sources, and waste accumulation. This is accomplished through requiring regular inspections and certifying continued compliance with fire safety regulations. This chapter also addresses outdoor assembly events, which are not limited to those events with tents or other membrane structures, but are regulated due to the number of people, density of those people and hazards associated with large outdoor events related to egress, fire hazards from cooking and other related concerns.*

SECTION 3101
GENERAL

3101.1 Scope. *Tents*, temporary special event structures and *membrane structures* shall comply with this chapter. The provisions of Section 3103 are applicable only to temporary *tents* and *membrane structures*. The provisions of Sections 3104 and ~~3106~~ 3107 are applicable to temporary and permanent *tents* and *membrane structures*. The provisions of Section 3105 are applicable to temporary special event structures. The provisions of Section 3106 are applicable to outdoor assembly events. Other temporary structures shall comply with the *International Building Code*.

SECTION 3103
TEMPORARY TENTS AND MEMBRANE STRUCTURES

3103.1 General. *Tents* and *membrane structures* used for temporary periods shall comply with this section and Section 310~~6~~7. Other temporary structures erected for a period of 180 days or less shall comply with the *International Building Code*.

3103.2 Approval required. *Tents* having an area in excess of 800 square feet and *membrane structures* having an area in excess of 400 square feet (37 m^2) shall not be erected, operated or maintained for any purpose without first obtaining a permit and approval from the *fire code official*.

Exceptions:

1. *Tents* used exclusively for recreational camping purposes.
2. *Tents* open on all sides that comply with all of the following:
   2.1. Individual *tents* having a maximum size of 1800 square feet (167 m^2).
   2.2. The aggregate area of multiple *tents* placed side by side without a fire break clearance of 12 feet (3658 mm), not exceeding 1800 square feet (167 m^2) total.
   2.3. A minimum clearance of 12 feet (3658 mm) to all structures and other *tents*.

3. Funeral *tents* and curtains or extensions attached thereto, when used for funeral services.

3103.4 Permits. Permits shall be required as set forth in Sections 105.5 and 105.6. The fire code official shall refer the permit applicant to the appropriate agency for other applicable occupational licensing and construction permitting requirements.

3103.5 Use period. ~~Temporary *tents*~~ A temporary tent, air-supported, air-inflated or tensioned membrane ~~*structures*~~ structure shall not be erected for a period of more than 180 consecutive days within a 12-month period on a single premises.

3103.12.2 Number. *Tents* or *membrane structures* or a usable portion thereof shall have not less than one *exit* and not less than the number of *exits* required by Table 3103.12.2. The total width of *means of egress* in inches (mm) shall be not less than the total *occupant load* served by a *means of egress* multiplied by 0.2 inches (5 mm) per person.

TABLE 3103.12.2
MINIMUM NUMBER OF MEANS OF EGRESS AND MEANS OF EGRESS WIDTHS FROM TEMPORARY MEMBRANE STRUCTURES AND TENTS

OCCUPANT LOAD	MINIMUM NUMBER OF MEANS OF EGRESS	MINIMUM WIDTH OF EACH MEANS OF EGRESS (inches)	MINIMUM WIDTH OF EACH MEANS OF EGRESS (inches)
		Tent	Membrane Structure
10 to 199	2	72	36
200 to 499	3	72	72
500 to 999	4	96	72
1,000 to 1,999	5 7	120 96	96
2,000 to 2,999	6 8	120 96	96
Over 3,000[a]	7 9	120 96	96

For SI: 1 inch = 25.4 mm.

a. When the occupant load exceeds 3,000, the total width of means of egress (in inches) shall be not less than the total occupant load multiplied by 0.2 inch per person.

3103.12.6.1 Exit sign illumination. *Exit* signs shall be either *listed* and *labeled* in accordance with UL 924 as the internally illuminated type and used in accordance with the listing or shall be externally illuminated by luminaires supplied in either of the following manners:

1. Two separate circuits, one of which shall be separate from all other circuits, for *occupant loads* of 300 or less.
2. Two separate sources of power, one of which shall be an *approved* emergency system, shall be provided where the *occupant load* exceeds 300. Emergency systems shall be supplied from storage batteries or from the on-site generator set, and the system shall be installed in accordance with NFPA 70. The emergency system provided shall have a minimum duration of 90 minutes when operated at full design demand.

Exception: Exit signs are not required to be illuminated on tents open on all sides used exclusively during daylight hours.

3103.12.7 Means of egress illumination. *Means of egress* shall be illuminated with light having an intensity of not less than 1 foot-candle (11 lux) at floor level while the structure is occupied. Fixtures required for *means of egress* illumination shall be supplied from a separate circuit or source of power.

Exception: Means of egress illumination is not required in tents open on all sides used exclusively during daylight hours.

SECTION 3107
OPERATIONAL REQUIREMENTS

3107.13.2 Location of containers. LP-gas containers and tanks shall be located outside in accordance with Table 3107.13.2. Pressure relief devices shall be pointed away from the *tent* or *membrane structure*.

TABLE 3107.13.2
LOCATION OF LP-GAS CONTAINERS

LP-GAS CONTAINER CAPACITY (water gallons)	MINIMUM SEPARATION BETWEEN LP-GAS CONTAINERS AND BUILDINGS,TENTS AND MEMBRANE STRUCTURES, PUBLIC WAYS[g] OR LOT LINES OF ADJOINING PROPERTY THAT CAN BE BUILT ON		MINIMUM SEPARATION BETWEEN LP-GAS CONTAINERS[b, c] (feet)
	Mounded or underground LP-gas containers[a] (feet)	Above-ground LP-gas containers[b] (feet)	
Less than 125[c, d]	10	5[e]	None
125 to 250	10	10	None
251 to 500	10	10	3
501 to 2,000	10	25[e, f]	3
2,001 to 30,000	50	50	5
30,001 to 70,000	50	75	(0.25 of sum of diameters of adjacent LP-gas containers)
70,001 to 90,000	50	100	
90,001 to 120,000	50	125	

For SI: 1 foot = 304.8 mm, 1 gallon = 3.785 L.

a. Minimum distance for underground LP-gas containers shall be measured from the pressure relief device and the filling or liquid-level gauge vent connection at the container, except that all parts of an underground LP-gas container shall be not less than 10 feet from a building or lot line of adjoining property that can be built on.

b. For other than installations in which the overhanging structure is 50 feet or more above the relief-valve discharge outlet. In applying the distance between buildings and ASME LP-gas containers with a water capacity of 125 gallons or more, not less than 50 percent of this horizontal distance shall also apply to all portions of the building that project more than 5 feet from the building wall and that are higher than the relief valve discharge outlet. This horizontal distance shall be measured from a point determined by projecting the outside edge of such overhanging structure vertically downward to grade or other level on which the LP-gas container is installed. Distances to the building wall shall be not less than those prescribed in this table.

c. Where underground multicontainer installations are composed of individual LP-gas containers having a water capacity of 125 gallons or more, such containers shall be installed so as to provide access at their ends or sides to facilitate working with cranes or hoists.

d. At a consumer site, if the aggregate water capacity of a multiple-container installation, comprised of individual LP-gas containers having a water capacity of less than 125 gallons, is 500 gallons or more, the minimum distance shall comply with the appropriate portion of this table, applying the aggregate capacity rather than the capacity per LP-gas container. If more than one such installation is made, each installation shall be separated from other installations by not less than 25 feet. Minimum distances between LP-gas containers need not be applied.

e. The following shall apply to above-ground containers installed alongside buildings:

1. LP-gas containers of less than a 125-gallon water capacity are allowed without a separation distance where in compliance with Items 2, 3 and 4.
2. Department of Transportation (DOTn) specification LP-gas containers shall be located and installed so that the discharge from the container pressure relief device is not less than 3 feet horizontally from building openings below the level of such discharge and shall not be beneath buildings unless the space is well ventilated to the outside and is not enclosed for more than 50 percent of its perimeter. The discharge from LP-gas container pressure relief devices shall be located not less than 5 feet from exterior sources of ignition, openings into direct-vent (sealed combustion system) appliances or mechanical ventilation air intakes.
3. ASME LP-gas containers of less than a 125-gallon water capacity shall be located and installed such that the discharge from pressure relief devices shall not terminate in or beneath buildings and shall be located not less than 5 feet horizontally from building openings below the level of such discharge and not less than 5 feet from exterior sources of ignition, openings into direct vent (sealed combustion system) appliances, or mechanical ventilation air intakes.
4. The filling connection and the vent from liquid-level gauges on either DOTn or ASME LP-gas containers filled at the point of installation shall be not less than 10 feet from exterior sources of ignition, openings into direct vent (sealed combustion system) appliances or mechanical ventilation air intakes.

f. This distance is allowed to be reduced to not less than 10 feet for a single LP-gas container of 1,200-gallon water capacity or less, provided that such container is not less than 25 feet from other LP-gas containers of more than 125-gallon water capacity.

g. Above-ground LP-gas containers with a water capacity of 2,000 gallons or less shall be separated from public ways by a distance of not less than 5 feet. Containers with a water capacity greater than 2,000 gallons shall be separated from public ways in accordance with this table.

3107.15 Display of motor vehicles. Liquid- and gas-fueled vehicles and equipment used for display within *tents* or *membrane structures* shall be in accordance with Sections 3107.15.1 through 3107.15.5.3.

3107.15.1 Batteries. The engine starting system is made inoperable or ~~B~~batteries shall be disconnected except where the *fire code official* requires that the batteries remain connected to maintain safety features.

Exception: Alternative-fueled vehicles in which manufacturer prohibits the disconnection of power supply.

3107.15.2 Fuel. Vehicles or equipment shall not be fueled or defueled within the *tent* or *membrane structure*.

3107.15.2.1 Quantity limit. Fuel in the fuel tank shall not exceed one-quarter of the tank capacity or 5 gallons (19 L), whichever is less.

Exception: Diesel-fueled vehicles, the maximum fuel amount permitted shall be 20 gallons.

3107.18 Combustible vegetation. Readily ignitable ~~Combustible~~ vegetation that could create a fire hazard shall be removed from the area occupied by a *tent* or *membrane structure*, and from areas within 30 feet (9144 mm) of such structures.

CHAPTER 32
HIGH-PILED COMBUSTIBLE STORAGE

~~**User note:**~~

~~***About this chapter:*** *Chapter 32 provides guidance for reasonable protection of life from hazards associated with the storage of combustible materials in closely packed piles or on pallets, in racks or on shelves where the top of storage is greater than 12 feet in height, or 6 feet for high-hazard commodities. It provides requirements for identifying various classes of commodities; and general fire and life safety features including storage arrangements, smoke and heat venting, fire department access and housekeeping and maintenance. This chapter attempts to define the potential fire severity and, in turn, determine fire and life safety protection measures needed to control and in some cases suppress a potential fire. This chapter does not cover miscellaneous combustible material storage as regulated in Section 315.*~~

SECTION 3201
GENERAL

3201.3 Construction documents. At the time of building permit application for new structures designed to accommodate high-piled storage or for requesting a change of occupancy/use, and at the time of application for a storage permit, plans and specifications shall be submitted for review and approval. In addition to the information required by the *International Building Code*, the storage permit submittal shall include the information specified in this section. The *construction documents* shall include all of the following:

1. Floor plan of the building showing locations and dimensions of *high-piled storage areas*.
2. Usable storage height for each storage area.
3. Number of tiers within each rack, if applicable.
4. Commodity clearance between top of storage and the sprinkler deflector for each storage arrangement.
5. Aisle dimensions between each storage array.
6. Maximum pile volume for each storage array.
7. Location and classification of commodities and plastic pallet types in accordance with Section 3203.
8. Location of commodities that are banded or encapsulated.
9. Location of required fire department access doors.
10. Type of fire protection systems.
11. Location of valves controlling the water supply of ceiling and in-rack sprinklers.
12. Type, location and specifications of smoke removal and curtain board systems.
13. Dimension and location of transverse and longitudinal flue spaces.
14. Additional information regarding required design features, commodities, storage arrangement and fire protection features within the *high-piled storage area* shall be provided at the time of permit, where required by the *fire code official*.

3201.3.2 Approved storage layout. A floor plan, of legible size, shall be provided, mounted on a wall and protected from damage. The floor plan shall be mounted in an *approved* location and show the following as applicable:

1. Locations, dimensions and rack layout of *high-piled storage areas*.
2. Design storage height for each storage area.
3. ~~Types~~ Class of commodities.
4. Commodity clearance between top of storage and the sprinkler deflector for each storage arrangement.
5. Aisle dimensions between each storage array.
6. For palletized and solid-piled storage, the maximum pile volume for each storage array.
7. Location and classification of commodities in accordance with Section 3203.
8. Location of required fire department access doors.
9. Location of valves controlling the water supply of ceiling and in-rack sprinklers.

SECTION 3205
HOUSEKEEPING AND MAINTENANCE

3205.1 Storage layout plan maintenance. The *approved* storage layout shall be verified and evaluated annually by the owner or owner's authorized agent in accordance with Section 3201.3.2 and Section 109.3. Modifications or changes to the provisions of the *approved* storage layout shall not be made without the prior approval of the *fire code official*.

SECTION 3206
GENERAL FIRE PROTECTION AND LIFE SAFETY FEATURES

3206.7.3 Access to doors. Fire department access doors shall be able to be accessed without the use of a ladder. Access shall comply with Section 504.

3206.7.5 Number of doors required. The required fire department access doors shall be distributed such that the lineal distance between adjacent fire department access doors does not exceed 125 feet (38 100 mm) measured center to center.

Exception: The linear distance between adjacent access doors shall not exceed 200 feet (60 960 mm) in existing buildings where change in occupancy is not proposed.

CHAPTER 33
FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION

User note:

About this chapter: *Chapter 33 outlines general fire safety precautions for all structures and all occupancies during construction and demolition operations. In general, these requirements seek to maintain required levels of fire protection, limit fire spread, establish the appropriate operation of equipment and promote prompt response to fire emergencies. There is an emphasis on owner responsibility and the need to create and implement a site safety plan. Features regulated include fire protection systems, fire fighter access to the site and building, water supply, means of egress, hazardous materials storage and use, and temporary heating equipment and other ignition sources. Fire watches are an important component of this chapter. This chapter correlates with Chapter 33 of the* International Building Code®.

SECTION 3303
OWNER'S RESPONSIBILITY FOR FIRE PROTECTION

3303.1 Program development and maintenance. The *owner* or *owner's* authorized agent shall be responsible for the development, implementation and maintenance of an *approved*, written *site safety plan* establishing a fire prevention program at the project site applicable throughout all phases of the construction, repair, *alteration* or demolition work. The plan shall be submitted and *approved* prior to the start of construction. before a building permit is issued. Any changes to the plan shall address the requirements of this chapter and other applicable portions of this code, the duties of staff and staff training requirements. The plan shall be submitted for approval.

3303.1.1 Components of site safety plans. *Site safety plans* shall include the following as applicable:

1. Name and contact information of site safety director.
2. Documentation of the training of the site safety director and fire watch personnel.
3. Procedures for reporting emergencies.
4. Fire department vehicle access routes.
5. Location of fire protection equipment, including portable fire extinguishers, standpipes, fire department connections and fire hydrants.
6. Smoking and cooking policies, designated areas to be used where *approved*, and signage locations in accordance with Section 3305.8.
7. Location and safety considerations for temporary heating equipment.
8. Hot work permit plan.
9. Plans for control of combustible waste material.
10. Locations and methods for storage and use of *flammable* and *combustible liquids* and other hazardous materials.
11. Provisions for site security.
12. Changes that affect this plan.
13. Other site-specific information required by the *fire code official*.

3303.3.1 Violations. Deleted see Section 109. Failure to properly conduct, document and maintain documentation required by this section shall constitute an unlawful act in accordance with Section 112.1 and shall result in the issuance of a notice of violation to the site safety director in accordance with Section 112.3. Upon the third offense, the *fire code official* is authorized to issue a stop work order in accordance with Section 113, and work shall not resume until satisfactory assurances of future compliance have been presented to and *approved* by the *fire code official*.

3303.4 Qualifications. Site safety directors shall acquire training specific to their roles and responsibilities. ~~Upon request, the~~ The training and qualifications of the site safety director shall be submitted to the *fire code official* for approval.

CHAPTER 34
TIRE REBUILDING AND TIRE STORAGE

~~**User note:**~~

~~***About this chapter:*** *Chapter 34 provides requirements that are intended to prevent or control fires and explosions associated with the remanufacture and storage of tires and tire byproducts. Additionally, the requirements are intended to minimize the impact of indoor and outdoor tire storage fires by regulating pile volume and location, segregating the various operations, providing for fire department access and a water supply, and controlling ignition sources.*~~

SECTION 3406
FIRE DEPARTMENT ACCESS

3406.1 Required access. New tire storage yards shall be provided with fire apparatus access roads in accordance with Section 503 and Section 3406.2. Existing tire storage yards shall be provided with fire apparatus access roads where required in ~~Chapter 11~~ Section 3406.1.1.

3406.1.1 Existing tire storage yards. Existing tire storage yards in excess of 150,000 cubic feet (4248 m_3) shall be provided with fire apparatus access roads in accordance with Sections 3406.1.1.1 and 3406.1.1.2.

3406.1.1.1 Access to piles. Access roadways shall be within 150 feet (45 720 mm) of any point in the storage yard where storage piles are located not less than 20 feet (6096 mm) from any other storage pile.

3406.1.1.2 Location within piles. Fire apparatus access roads shall be located within all pile clearances identified in Section 3405.4 and within all fire breaks required in Section 3405.5.

CHAPTER 35
WELDING AND OTHER HOT WORK

~~**User note:**~~

~~***About this chapter:*** *Chapter 35 covers requirements for safety in welding and other types of hot work by reducing the potential for fire ignitions that usually result in large losses. Several different types of hot work would fall under the requirements found in Chapter 35, including both gas and electric arc methods and any open-torch operations. Many of the activities of this chapter focus on the actions of the occupants.*~~

CHAPTER 36
MARINAS

~~**User note:**~~

~~***About this chapter:*** *Chapter 36 addresses the fire protection and prevention requirements for marinas. It was developed in response to the complications encountered by a number of fire departments responsible for the protection of marinas as well as fire loss history in marinas that lacked fire protection. Compliance with this chapter intends to establish safe practices in marina areas, provide an identification method for mooring spaces in the marina, and provide fire fighters with safe operational areas and fire protection methods to extend hose lines in a safe manner.*~~

SECTION 3602
DEFINITIONS

3602.1 Definitions. The following terms are defined in Chapter 2:

PRIVATE WATERFRONT STRUCTURE.

PUBLIC WATERFRONT STRUCTURE.

SECTION 3604
FIRE PROTECTION EQUIPMENT

3604.1 General. *Marinas, public waterfront structures* ~~Piers, marinas and wharves with facilities for mooring or servicing five or more vessels,~~ and *marine motor fuel-dispensing facilities* shall be equipped with fire protection equipment in accordance with Sections 3604.2 through 3604.6.

~~**Exception:** *Private waterfront structures.*~~

3604.2 Standpipes. *Marinas, public waterfront structures* and boatyards shall be equipped throughout with standpipe systems in accordance with NFPA 303. Systems shall be provided with hose connections located such that no point on the marina pier or float system exceeds 150 feet (15 240 mm) from a standpipe hose connection.

CHAPTER 37
COMBUSTIBLE FIBERS

~~**User note:**~~

~~***About this chapter:** Chapter 37 establishes the requirements for storage and handling of combustible fibers, including animal, vegetable and synthetic fibers, whether woven into textiles, baled, packaged or loose. Operations involving combustible fibers are typically associated with salvage, paper milling, recycling, cloth manufacturing, carpet and textile mills and agricultural operations, among others. The primary hazard associated with these operations is the abundance of materials and their ready ignitability.~~

CHAPTER 38
HIGHER EDUCATION LABORATORIES

~~**User note:**~~

~~***About this chapter:** Chapter 38 addresses the unique needs of laboratories in higher education institutions. These academic institutions often have chemistry, biology, medical, engineering and other laboratories where hazardous materials are used. This chapter addresses both new and existing buildings and new and existing laboratories. Applying the general hazardous material provisions has been difficult because of the way these laboratories operate. Often there are many small laboratories with very small quantities of hazardous materials that individually do not exceed the maximum allowable quantities (MAQs). In aggregate, the quantities will exceed the MAQs and could result in the need for a Group H occupancy classification. However, it is believed that the lower density of hazardous materials often mitigates the overall risk. This chapter also addresses the use of certain materials typically prohibited for existing buildings not protected throughout with a sprinkler system. These allowances come with certain safety measures such as the use of storage cabinets and fume hoods. Note that Section 428 of the International Building Code© addresses the construction requirements found in this chapter for laboratory suites.~~

CHAPTER 39
PROCESSING AND EXTRACTION FACILITIES

~~**User note:**~~

~~***About this chapter:** Chapter 39 focuses on the processing and extraction of oils and fats from various plants. This process includes extraction by use of a solvent, desolventizing the raw material, production of the miscella, distillation of the solvent from the miscella and solvent recovery.~~

~~*The processes used are not necessarily typical hazardous material processes, and often the systems and equipment associated with such processes may not be listed. This chapter provides the tools to appropriately address the hazards while also meeting the unique needs of industry. This chapter has provisions for a technical report prepared by a registered design professional and requires site inspections to make sure equipment and systems are installed as designed and approved.*~~

CHAPTER 40

STORAGE OF DISTILLED SPIRITS AND WINES

~~**User note:**~~

~~***About this chapter:** Chapter 40 provides specific requirements for the storage of distilled spirits and wines. In accordance with Section 307.1.1 of the* International Building Code®*, these occupancies are not classified as a Group H occupancy. Instead, as listed in Sections 311.2 and 311.3 of the* International Building Code*, the storage of beverages that contain up to and including 16-percent alcohol are classified as a Group S-2 occupancy, and those that contain over 16-percent alcohol content are classified as a Group S-1 occupancy. Note that those that are classified as a Group S-1 occupancy are required to be provided with an automatic sprinkler system throughout the Group S-1 fire area, regardless of size, in accordance with Section 903.*~~

SECTION 4003
PRECAUTIONS AGAINST FIRE

4003.4 Lightning. Structures containing barrel storage shall ~~should~~ be protected from lightning. The lightning protection equipment shall be installed in accordance with NFPA 70 and NFPA 780.

SECTION 4004
STORAGE

4004.3 Basement storage. Class I *flammable liquids* shall be allowed to be stored in basements in amounts not exceeding the *maximum allowable quantity per control area* for use-open systems in Table 5003.1.1(1), provided that automatic suppression and other fire protection are provided in accordance with Chapter 9. Class II and IIIA *combustible liquids* shall also be allowed to be stored in *basements*, provided that automatic suppression and other fire protection are provided in accordance with Chapter 9.

Part V—Hazardous Materials

CHAPTER 50

HAZARDOUS MATERIALS—GENERAL PROVISIONS

~~**User note:**~~

~~***About this chapter:** Chapter 50 contains the general requirements for all hazardous materials in all occupancies. Hazardous materials are defined as those that pose an unreasonable risk to the health and safety of operating or emergency personnel, the public and the environment if not properly controlled during handling, storage, manufacture, processing, packaging, use, disposal or transportation. The general provisions of this chapter are intended to be companion provisions with the specific requirements of Chapters 51 through 67 regarding a given hazardous material. Also, Sections 414 and 415 of the* International Building Code® *contain construction requirements related to the storage and use of such materials.*~~

SECTION 5001
GENERAL

5001.5 Permits. Permits shall be required as set forth in Sections 105.5 and 105.6.

~~Where required by the *fire code official*,~~ Permittees shall apply for approval to permanently close a storage, use or handling facility. Such application shall be submitted not less than 30 days prior to the termination of the storage, use or handling of hazardous materials. The *fire code official* is authorized to require that the application be accompanied by an *approved* facility closure plan in accordance with Section 5001.6.3.

5001.5.1 Hazardous Materials Management Plan. ~~Where required by the *fire code official*,~~ An application for a permit shall include a Hazardous Materials Management Plan (HMMP), in accordance with Appendix H. The HMMP shall include a facility site plan designating the following:

1. Access to each storage and use area.
2. Location of emergency equipment.
3. Location where liaison will meet emergency responders.
4. Facility evacuation meeting point locations.
5. The general purpose of other areas within the building.
6. Location of all above-ground and underground tanks and their appurtenances including, but not limited to, sumps, vaults, below-grade treatment systems and piping.
7. The hazard classes in each area.
8. Locations of all *control areas* and Group H occupancies.
9. Emergency *exits*.

5001.5.2 Hazardous Materials Inventory Statement (HMIS). ~~Where required by the *fire code official*,~~ An application for a permit shall include an HMIS, such as Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III, Tier II Report or other *approved* statement in accordance with Appendix H. The HMIS shall include the following information:

1. Product name.
2. Component.
3. Chemical Abstract Service (CAS) number.
4. Location where stored or used.
5. Container size.
6. Hazard classification.
7. Amount in storage.
8. Amount in use-*closed systems*.
9. Amount in use-*open systems*.

SECTION 5003
GENERAL REQUIREMENTS

5003.8.6 Gas cabinets. Where a gas cabinet is used to increase the *maximum allowable quantity per control area* or where the location of *compressed gases* in *gas cabinets* is provided to comply with the provisions of Chapter 60, the gas cabinet shall be in accordance with Sections 5003.8.6.1 through 5003.8.6.3.

5003.8.6.1 Construction. Gas cabinets shall be constructed with all of the following:

1. Not less than 0.097-inch (2.5 mm) (No. 12 gage) steel.
2. Self-closing limited access ports or noncombustible windows to give access to equipment controls.
3. Self-closing doors.
4. Interiors treated, coated or constructed of materials that are compatible with the hazardous materials stored. Such treatment, coating or construction shall include the entire interior of the cabinet.

CHAPTER 51
AEROSOLS

~~**User note:**~~

~~***About this chapter:*** *Chapter 51 provides requirements for the prevention, control and extinguishment of fires and explosions in facilities where retail aerosol products are displayed or stored. It is concerned with both life safety and property protection from a fire; however, historically, aerosol product fires have caused property loss more frequently than loss of life. Requirements for storing aerosol products are dependent on the level of aerosol product, level of sprinkler protection, type of storage condition and quantity of aerosol products.*~~

SECTION 5104
INSIDE STORAGE OF AEROSOL PRODUCTS

5104.1.1 Plastic aerosol products. Aerosol products in plastic containers larger than 4 fluid ounces (118 ml), but not to exceed 33.8 fluid ounces (1000 ml), shall be allowed only where in accordance with this section. The commodity classification shall be Class III commodities, as defined in NFPA 13 where any of the following conditions are met:

1. Base product does not have a fire point where tested in accordance with ASTM D92, and nonflammable propellant.
2. Base product does not sustain combustion as tested in accordance with Appendix H of DOTn 49 CFR Part 173~~, Appendix H,~~ and nonflammable propellant.
3. Base product contains up to 20 percent by volume (15.8 percent by weight) of ethanol, isopropyl alcohol or a combination thereof in an aqueous mix, and nonflammable propellant.
4. Base product contains 4 percent by weight or less of an emulsified flammable liquefied gas propellant within an aqueous base. The propellant shall remain emulsified for the life of the product. Where such propellant is not permanently emulsified, the propellant shall be nonflammable.

5104.1.2 Plastic aerosol 3 products. Plastic aerosol 3 products shall be defined as those that meet one of the following criteria:

1. Base product does not have a fire point where tested in accordance with ASTM D92, and there is not more than 10 percent by weight flammable propellant.
2. Base product does not sustain combustion as tested in accordance with Appendix H of DOTn 49 CFR 173~~, Appendix H,~~ and there is not more than 10 percent by weight flammable propellant.
3. Base product contains 50 percent by volume or less of flammable or combustible water-miscible alcohols in an aqueous mix, and there is not more than 10 percent by weight of flammable propellant.

CHAPTER 53
COMPRESSED GASES

~~**User note:**~~

~~***About this chapter:*** *Chapter 53 regulates the storage, use and handling of all flammable and nonflammable compressed gases, such as those that are used in medical facilities, air separation plants, industrial plants, agricultural equipment and similar occupancies. Also, this chapter regulates inert gases, such as CO_2 used for enrichment and beverage dispensing, that although inert are considered asphyxiants and in larger amounts pose a life safety hazard. Standards for the design, construction and marking of compressed gas cylinders and pressure vessels are referenced. Compressed gases used in welding and cutting, cryogenic liquids and liquefied petroleum gases are also regulated under Chapters 35, 55 and 61, respectively. Compressed gases that are classified as hazardous materials are also regulated in Chapter 50, which includes general requirements.*~~

SECTION 5301
GENERAL

5301.1 Scope. Storage, use and handling of *compressed gases* in *compressed gas* containers, cylinders, tanks and systems shall comply with this chapter and NFPA 55, including those gases regulated elsewhere in this code. Partially full *compressed gas* containers, cylinders or tanks containing residual gases shall be considered as full for the purposes of the controls required.

Liquefied natural gas for use as a vehicular fuel shall also comply with NFPA 52 and NFPA 59A.

Compressed gases classified as hazardous materials shall also comply with Chapter 50 for general requirements and chapters addressing specific hazards, including Chapters 58 (Flammable Gases and Flammable Cryogenic Fluids), 60 (Highly Toxic and Toxic Materials), 63 (Oxidizers, Oxidizing Gases and Oxidizing Cryogenic Fluids) and 64 (Pyrophoric Materials).

Compressed hydrogen (CH_2) shall also comply with the applicable portions of Chapters 23 and 58 of this code, the *International Fuel Gas Code* and NFPA 2.

Cutting and welding gases shall also comply with Chapter 35.

Exceptions:

1. Gases used as refrigerants in refrigeration systems (see Section 608).
2. Compressed natural gas (CNG) for use as a vehicular fuel shall comply with Chapter 23, the *International Fuel Gas Code* and NFPA 52.
3. *Cryogenic fluids* shall comply with Chapter 55.
4. LP-gas shall comply with Chapter 61 and the *International Fuel Gas Code*, Chapter 119 Article 5 of the General Statutes, and 02 NCAC 38, Section .0700.

5301.2 Permits. Permits shall be required as set forth in Section 105.5 and 105.6.

SECTION 5306
MEDICAL GASES

5306.2.3 Gas cabinets. Gas cabinets shall be constructed in accordance with Section 5003.8.6 and shall comply with all of the following:

1. Exhausted to the exterior through dedicated exhaust duct system installed in accordance with Chapter 5 of the *International Mechanical Code*.
2. Supply and exhaust ducts shall be enclosed in a 1-hour *fire-resistance-rated* shaft enclosure from the cabinet to the exterior. The average velocity of ventilation at the face of access ports or windows shall be not less than 200 feet per minute (1.02 m/s) with not less than 150 feet per minute (0.76 m/s) at any point of the access port or window.
3. Provided with an *automatic sprinkler system* internal to the cabinet.

CHAPTER 54
CORROSIVE MATERIALS

~~**User note:**~~

~~***About this chapter:*** *Chapter 54 addresses the hazards of corrosive materials that have a destructive effect on living tissues. Though corrosive gases exist, most corrosive materials are solid or liquid and classified as either acids or bases (alkalis). These materials may pose a wide range of hazards other than corrosivity, such as combustibility, reactivity or oxidizing hazards, and must conform to the requirements of this code with respect to all of their known hazards. The focus of this chapter is on materials whose primary hazard is corrosivity; that is, the ability to destroy or irreparably damage living tissue on contact.~~

CHAPTER 55
CRYOGENIC FLUIDS

~~**User note:**~~

~~***About this chapter:*** *Chapter 55 regulates the hazards associated with the storage, use and handling of cryogenic fluids through regulation of such things as pressure relief mechanisms and proper container storage. These hazards are in addition to the code requirements that address the other hazards of cryogenic fluids such as flammability and toxicity. These other characteristics are dealt with in Chapter 50 and other chapters, such as Chapter 58 and its content about flammable gases. Cryogens are hazardous because they are held at extremely low temperatures and high pressures. Many cryogenic fluids, however, are actually inert gases and would not be regulated elsewhere in this code. Cryogens are used for many applications but specifically have had widespread use in the biomedical field and in space programs.*

CHAPTER 56
EXPLOSIVES AND FIREWORKS

~~**User note:**~~

~~***About this chapter:*** *Chapter 56 prescribes minimum requirements for the safe manufacture, storage, handling and use of explosives, ammunition and blasting agents for commercial and industrial occupancies. These provisions are intended to protect the general public, emergency responders and individuals who handle explosives. It also regulates the manufacturing, retail sale, display and wholesale distribution of fireworks; establishes the requirements for obtaining approval to manufacture, store, sell, discharge or conduct a public display; and references national standards for regulations governing manufacture, storage and public displays.*

SECTION 5601
GENERAL

5601.1 Scope. The provisions of this chapter shall govern the possession, manufacture, storage, handling, sale and use of *explosives*, *explosive materials*, fireworks and small arms ammunition.

Exceptions:

1. The Armed Forces of the United States, Coast Guard or National Guard.
2. *Explosives* in forms prescribed by the official United States Pharmacopoeia.
3. The possession, storage and use of small arms ammunition where packaged in accordance with DOTn packaging requirements.
4. The possession, storage and use of not more than 1 pound (0.454 kg) of commercially manufactured sporting black powder, 20 pounds (9 kg) of smokeless powder and 10,000 small arms primers for hand loading of small arms ammunition for personal consumption.
5. The use of *explosive materials* by federal, state and local regulatory, law enforcement and fire agencies acting in their official capacities.
6. Special industrial *explosive* devices that in the aggregate contain less than 50 pounds (23 kg) of *explosive materials*.
7. The possession, storage and use of blank industrial-power load cartridges where packaged in accordance with DOTn packaging regulations.
8. Transportation in accordance with DOTn 49 CFR Parts 100–185.
9. Items preempted by federal regulations.
10. The possession, storage, transportation and use of explosive materials by companies permitted under the provisions of N.C.G.S. Chapter 74, Article 7.

5601.2.4.2 Fireworks display. The permit holder shall furnish a bond or certificate of insurance in an amount specified by N.C.G.S. 14-413 (d) deemed adequate by the *fire code official* for the payment of all potential damages to a person or persons or to property by reason of the permitted display, and arising from any acts of the permit holder, the agent, employees or subcontractors.

SECTION 5602
DEFINITIONS

5602.1 Definitions. The following terms are defined in Chapter 2:

DISPLAY OPERATOR

DISPLAY OPERATOR'S LICENSE

SECTION 5608
FIREWORKS DISPLAY

5608.2 Permit application. Prior to issuing permits for a fireworks display, plans for the fireworks display, inspections of the display site and demonstrations of the display operations shall be *approved*. A plan establishing procedures to follow and actions to be taken in the event that a shell fails to ignite in, or discharge from, a mortar or fails to function over the fallout area or other malfunctions shall be provided to the *fire code official*. Prior to issuing any fireworks permits regulated by this code, the *fire code official* shall verify that permission has been granted to conduct a fireworks display in accordance with N.C.G.S. 14-410.

5608.3 Approved fireworks displays. *Approved* fireworks displays shall include only the *approved* fireworks, 1.1G fireworks 1.3G, fireworks 1.4G, fireworks 1.4S and pyrotechnic articles 1.4G, which shall be handled by an *approved*, competent operator. The *approved* fireworks shall be arranged, located, discharged and fired in a manner that will not pose a hazard to property or endanger any person. Approved Division 1.1G, 1.3G and 1.4G displays shall be handled by a *display operator* possessing a *Display Operator's License* issued by the Office of State Fire Marshal. Prior to granting approval to any fireworks display, the *fire code official* shall verify that the *display operator* and the display operator's assistants are properly licensed in accordance with the NC Fireworks Display Operator's rules, N.C.G.S. 58 Article 82A and 11 NCAC 05D.

SECTION 5610
RETAIL SALES OF CONSUMER FIREWORKS

5610.1 Fireworks allowed by North Carolina General Statute 14-414 shall be permitted to be sold or possessed without a permit. A minimum of one pressurized water fire extinguisher complying with Section 906 shall be located not more than 15 feet (4572 mm) and not less than 10 feet (3048 mm) from the hazard. "No Smoking" signs complying with Section 310 shall be posted in areas where fireworks are stored or displayed for retail sale. No sale of fireworks shall be made to persons less than 16 years of age in accordance with N.C.G.S 14-410.

CHAPTER 57
FLAMMABLE AND COMBUSTIBLE LIQUIDS

~~**User note:**~~

~~***About this chapter:*** *Chapter 57 provides requirements that are intended to reduce the likelihood of fires involving the storage, handling, use or transportation of flammable and combustible liquids. Adherence to these practices may also limit damage in the event of an accidental fire involving these materials. These liquids are used for fuel, lubricants, cleaners, solvents, medicine and even drinking. The danger associated with flammable and combustible liquids is that the vapors from these liquids, when combined with air in their flammable range, will burn or explode at temperatures near normal living and working environments. The regulations herein are intended to prevent the flammable and combustible liquids from being ignited and provide mitigating requirements for when a fire does occur.*~~

SECTION 5704
STORAGE

5704.2.13.1.3 Out of service for one year. Underground tanks that have been out of service for a period of one year shall be removed from the ground in accordance with Section 5704.2.14 or abandoned in place in accordance with Section 5704.2.13.1.4.

Exception: Underground tanks and connected piping that comply with North Carolina Underground Storage Tank operating permit requirements for new or upgraded systems may remain out of service indefinitely so long as they remain in compliance with the operation, maintenance and release detection requirements and are safeguarded in accordance with Section 5704.2.13.1.2.

SECTION 5705
DISPENSING, USE, MIXING AND HANDLING

5705.3.6.1 Cleaning operations. Class IA liquids shall not be used for cleaning. Cleaning with Class IB, IC or II liquids shall be conducted as follows:

1. In a room or building in accordance with Section 5705.3.7; or
2. In a parts cleaner *listed*, *labeled* and *approved* for the purpose in accordance with Section 5705.3.6.2.

Exception: Materials used in commercial and industrial process-related cleaning operations in accordance with other provisions of this code and not involving facilities maintenance cleaning operations.

SECTION 5707
ON-DEMAND MOBILE FUELING OPERATIONS

5707.3.2 Training records. Mobile fueling vehicles shall be operated only by designated personnel who are trained on proper fueling procedures and the safety and emergency response plan. Training records of operators shall be maintained by the *owner* and available to *fire code official* upon request.

CHAPTER 58
FLAMMABLE GASES AND FLAMMABLE CRYOGENIC FLUIDS

~~**User note:**~~

~~***About this chapter:*** *Chapter 58 sets requirements for the storage and use of flammable gases. For safety purposes, there is a limit on the quantities of flammable gas allowed per control area. Exceeding these limitations increases the possibility of damage to both property and individuals. The principal hazard posed by flammable gas is its ready ignitability, or even explosivity, when mixed with air in the proper proportions. Consequently, occupancies storing or handling large quantities of flammable gas are classified as Group H-2 (high hazard) by the International Building Code®.*~~

CHAPTER 59
FLAMMABLE SOLIDS

~~**User note:**~~

~~***About this chapter:*** *Chapter 59 addresses general requirements for storage and handling of flammable solids, especially magnesium; however, it is important to note that several other solid materials, including such metals as titanium, zirconium, hafnium, calcium, zinc, sodium, lithium, potassium, sodium/potassium alloys, uranium, thorium and plutonium, can be explosion hazards under the right conditions. Some of*~~

these metals are almost exclusively laboratory materials but because of where they are used, fire service personnel must be trained to handle emergency situations. Because uranium, thorium and plutonium are also radioactive materials, they pose more specialized problems for fire service personnel.

CHAPTER 60
HIGHLY TOXIC AND TOXIC MATERIALS

User note:

About this chapter: *Chapter 60 provides requirements to protect occupants, emergency responders and those in the immediate area of the building and facility from short-term, acute hazards associated with a release of, or general exposure to, toxic and highly toxic materials. This chapter deals with all three states of toxic and highly toxic materials: solids, liquids and gases. This code does not address long-term exposure effects of these materials, which are addressed by agencies such as the Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA).*

CHAPTER 61
LIQUEFIED PETROLEUM GASES

User note:

About this chapter: *Chapter 61 provides requirements for the safe handling, storing and use of LP-gas to reduce the possibility of damage to containers, accidental releases of LP-gas, and exposure of flammable concentrations of LP-gas to ignition sources. LP-gas (notably propane) is well-known as a camping fuel for cooking, lighting, heating and refrigerating and also remains a popular standby fuel supply for auxiliary generators, as well as being widely used as an alternative motor vehicle fuel. Its characteristic as a clean-burning fuel has resulted in the addition of propane dispensers to service stations throughout the country. Dispensing LP-gas into motor vehicles is addressed by Chapter 23.*

SECTION 6101
GENERAL

6101.1 Scope. ~~Storage, handling and transportation of liquefied petroleum gas (LP-gas) and the installation of LP-gas equipment pertinent to systems for such uses shall comply with this chapter and NFPA 58. Properties of LP-gases shall be determined in accordance with Appendix B of NFPA 58.~~ The storage, handling and transportation of liquefied petroleum gas and the installation of all equipment pertinent to systems for such uses upstream of the outlet of the first stage regulator shall be governed by Chapter 119, Article 5 of the General Statutes of North Carolina and by the 02 NCAC 38, Section .0700.

6101.2 Permits. ~~Permits shall be required as set forth in Sections 105.5 and 105.6~~. For permits see Chapter 1.

Distributors shall not fill an LP-gas container for which a permit is required unless a permit for installation has been issued for that location by the *fire code official*.

6101.3 Construction documents. Deleted. ~~Where a single LP-gas container is more than 2,000 gallons (7570 L) in water capacity or the aggregate water capacity of LP-gas containers is more than 4,000 gallons (15 140 L), the installer shall submit *construction documents* for such installation.~~

6101.4 Inspection. It shall be the duty of the North Carolina Department of Agriculture and Consumer Services to inspect liquefied petroleum gas installations to determine compliance with the provisions of this chapter.

6101.5 Installation. All liquefied petroleum gas equipment including such equipment installed at utility gas plants shall be installed in accordance with the provisions of NFPA 58 and NFPA 59, except as otherwise provided in this chapter or in other statutes or regulations.

6101.6 Maximum capacity within established limits. Within the limits established by law restricting the storage of liquefied petroleum gas for the protection of heavily populated or congested areas, the aggregate capacity of any one installation shall not exceed a water capacity of 2,000 gallons (7570 L) **[JURISDICTION TO SPECIFY]**.

Exception: In particular installations, this capacity limit shall be determined by the *fire code official*, after consideration of special features such as topographical conditions, nature of occupancy, and proximity to buildings, capacity of proposed LP-gas containers, degree of fire protection to be provided and capabilities of the local fire department.

SECTION 6103
INSTALLATION OF EQUIPMENT

Deleted

~~**6103.1 General.** LP-gas equipment shall be installed in accordance with the *International Fuel Gas Code* and NFPA 58, except as otherwise provided in this chapter.~~

~~**6103.2 Use of LP-gas containers in buildings.** The use of LP-gas containers in buildings shall be in accordance with Sections 6103.2.1 through 6103.2.2.~~

~~**6103.2.1 Portable containers.** Portable LP-gas containers, as defined in NFPA 58, shall not be used in buildings except as specified in NFPA 58 and Sections 6103.2.1.1 through 6103.2.1.7.~~

~~**6103.2.1.1 Use in basement, pit or similar location.** LP-gas containers shall not be used in a *basement*, pit, above-grade underfloor space or similar location where heavier-than-air gas might collect unless such location is provided with an *approved* means of ventilation.~~

~~**Exception:** Use with self-contained torch assemblies in accordance with Section 6103.2.1.6.~~

~~**6103.2.1.2 Construction and temporary heating.** Portable LP-gas containers are allowed to be used in buildings or areas of buildings undergoing construction or for temporary heating as set forth in Sections 6.22.4, 6.22.5 and 6.22.8 of NFPA 58.~~

~~**6103.2.1.3 Group F occupancies.** In Group F occupancies, portable LP-gas containers are allowed to be used to supply quantities necessary for processing, research or experimentation. Where manifolded, the aggregate water capacity of such containers shall not exceed 735 pounds (334 kg) per manifold. Where multiple manifolds of such containers are present in the same room, each manifold shall be separated from other manifolds by a distance of not less than 20 feet (6096 mm).~~

~~**6103.2.1.4 Research and experimentation.** In Group I occupancies and laboratories for educational use in Group B and E occupancies, portable LP-gas containers are allowed to be used for research and experimentation. Such containers shall not be used in classrooms. Such containers shall not exceed a 50-pound (23 kg) water capacity in occupancies used for educational purposes and shall not exceed a 12-pound (5 kg) water capacity in occupancies used for institutional purposes. Where more than one such container is present in the same room, each container shall be separated from other containers by a distance of not less than 20 feet (6096 mm).~~

~~**6103.2.1.5 Demonstration uses.** Portable LP-gas containers are allowed to be used temporarily for demonstrations and public exhibitions. Such containers shall not exceed a water capacity of 12 pounds (5 kg). Where more than one such container is present in the same room, each container shall be separated from other containers by a distance of not less than 20 feet (6096 mm).~~

~~**6103.2.1.6 Use with self-contained torch assemblies.** Portable LP-gas containers are allowed to be used to supply *approved* self-contained torch assemblies or similar appliances. Such containers shall not exceed a water capacity of 2.7 pounds (1.2 kg).~~

~~**6103.2.1.7 Use for food preparation.** Where *approved*, *listed* LP-gas commercial food service appliances are allowed to be used for food preparation within restaurants and in attended commercial food catering operations in accordance with the *International Fuel Gas Code*, the *International Mechanical Code* and NFPA 58.~~

6103.2.2 Industrial vehicles and floor maintenance machines. LP-gas containers on industrial vehicles and floor maintenance machines shall comply with Sections 11.11 and 11.12 of NFPA 58.

6103.3 Location of equipment and piping. Equipment and piping shall not be installed in locations where such equipment and piping is prohibited by the *International Fuel Gas Code*.

SECTION 6104
LOCATION OF LP-GAS CONTAINERS

Deleted

6104.1 General. The storage and handling of LP-gas and the installation and maintenance of related equipment shall comply with NFPA 58 and be subject to the approval of the *fire code official*, except as provided in this chapter.

6104.2 Maximum capacity within established limits. Within the limits established by law restricting the storage of liquefied petroleum gas for the protection of heavily populated or congested areas, the aggregate capacity of any one installation shall not exceed a water capacity of 2,000 gallons (7570 L) **[JURISDICTION TO SPECIFY]**.

Exception: In particular installations, this capacity limit shall be determined by the *fire code official*, after consideration of special features such as topographical conditions, nature of occupancy, and proximity to buildings, capacity of proposed LP-gas containers, degree of fire protection to be provided and capabilities of the local fire department.

6104.3 Container location. LP-gas containers shall be located with respect to buildings and *lot lines* of adjoining property that can be built on, in accordance with Table 6104.3.

TABLE 6104.3
LOCATION OF LP-GAS CONTAINERS

LP-GAS CONTAINER CAPACITY (water gallons)	MINIMUM SEPARATION BETWEEN LP-GAS CONTAINERS AND BUILDINGS, PUBLIC WAYS[a] OR LOT LINES OF ADJOINING PROPERTY THAT CAN BE BUILT ON		MINIMUM SEPARATION BETWEEN LP-GAS CONTAINERS[b, c] (feet)
	Mounded or underground LP-gas containers[a] (feet)	Above-ground LP-gas containers[b] (feet)	
Less than 125[c, d]	10	5[e]	None
125 to 250	10	10	None
251 to 500	10	10	3
501 to 2,000	10	25[e, f]	3
2,001 to 30,000	50	50	5
30,001 to 70,000	50	75	(0.25 of sum of diameters of adjacent LP-gas containers)
70,001 to 90,000	50	100	
90,001 to 120,000	50	125	

For SI: 1 foot = 304.8 mm, 1 gallon = 3.785 L.

a. Minimum distance for underground LP-gas containers shall be measured from the pressure relief device and the filling or liquid-level gauge vent connection at the container, except that all parts of an underground LP-gas container shall be not less than 10 feet from a building or lot line of adjoining property that can be built on.

b. For other than installations in which the overhanging structure is 50 feet or more above the relief-valve discharge outlet. In applying the distance between buildings and ASME LP-gas containers with a water capacity of 125 gallons or more, not less than 50 percent of this horizontal distance shall also apply to all portions of the building that project more than 5 feet from the building wall and that are higher than the relief valve discharge outlet. This horizontal distance shall be measured from a point determined by projecting the outside edge of such overhanging structure vertically downward to grade or other level on which the LP-gas container is installed. Distances to the building wall shall be not less than those prescribed in this table.

c. Where underground multicontainer installations are composed of individual LP-gas containers having a water capacity of 125 gallons or more, such containers shall be installed so as to provide access at their ends or sides to facilitate working with cranes or hoists.

d. At a consumer site, if the aggregate water capacity of a multiple-container installation, comprised of individual LP-gas containers having a water capacity of less than 125 gallons, is 500 gallons or more, the minimum distance shall comply with the appropriate portion of this table, applying the aggregate capacity rather than the capacity per LP-gas container. If more than one such installation is made, each installation shall be separated from other installations by not less than 25 feet. Minimum distances between LP-gas containers need not be applied.

e. The following shall apply to above-ground containers installed alongside buildings:

1. LP-gas containers of less than a 125-gallon water capacity are allowed without a separation distance where in compliance with Items 2, 3 and 4.
2. Department of Transportation (DOTn) specification LP-gas containers shall be located and installed so that the discharge from the container pressure relief device is not less than 3 feet horizontally from building openings below the level of such discharge and shall not be beneath buildings unless the space is well ventilated to the outside and is not enclosed for more than 50 percent of its perimeter. The discharge from LP-gas container pressure relief devices shall be located not less than 5 feet from exterior sources of ignition, openings into direct-vent (sealed combustion system) appliances or mechanical ventilation air intakes.
3. ASME LP-gas containers of less than a 125-gallon water capacity shall be located and installed such that the discharge from pressure relief devices shall not terminate in or beneath buildings and shall be located not less than 5 feet horizontally from building openings below the level of such discharge and not less than 5 feet from exterior sources of ignition, openings into direct vent (sealed combustion system) appliances, or mechanical ventilation air intakes.
4. The filling connection and the vent from liquid-level gauges on either DOTn or ASME LP-gas containers filled at the point of installation shall be not less than 10 feet from exterior sources of ignition, openings into direct vent (sealed combustion system) appliances or mechanical ventilation air intakes.

f. This distance is allowed to be reduced to not less than 10 feet for a single LP-gas container of 1,200-gallon water capacity or less, provided that such container is not less than 25 feet from other LP-gas containers of more than 125-gallon water capacity.

g. Above-ground LP-gas containers with a water capacity of 2,000 gallons or less shall be separated from public ways by a distance of not less than 5 feet. Containers with a water capacity greater than 2,000 gallons shall be separated from public ways in accordance with this table.

6104.3.1 Installation on roof prohibited. LP-gas containers used in stationary installations shall not be located on the roofs of buildings.

6104.3.2 Special hazards. LP-gas containers shall be located with respect to special hazards including, but not limited to, above-ground *flammable* or *combustible liquid* tanks, oxygen or gaseous hydrogen containers, flooding or electric power lines as specified in Section 6.5.3 of NFPA 58.

6104.4 Multiple LP-gas container installations. Multiple LP-gas container installations with a total water storage capacity of more than 180,000 gallons (681.3 kL) [150,000-gallon (567.8 kL) LP-gas capacity] shall be subdivided into groups containing not more than 180,000 gallons (681.3 kL) in each group. Such groups shall be separated by a distance of not less than 50 feet (15 240 mm), unless the containers are protected in accordance with one of the following:

1. Mounded in an *approved* manner.
2. Protected with *approved* insulation on areas that are subject to impingement of ignited gas from pipelines or other leakage.
3. Protected by *fire walls* of *approved* construction.
4. Protected by an *approved* system for application of water as specified in Table 6.5.1.2 of NFPA 58.
5. Protected by other *approved* means.

Where one of these forms of protection is provided, the separation shall be not less than 25 feet (7620 mm) between LP-gas container groups.

SECTION 6105
PROHIBITED USE OF LP-GAS

Deleted

6105.1 Nonapproved equipment. LP-gas shall not be used for the purpose of operating devices or equipment unless such device or equipment is *approved* for use with LP-gas.

6105.2 Release to the atmosphere. LP-gas shall not be released to the atmosphere, except in accordance with Section 7.3 of NFPA 58.

SECTION 6106
DISPENSING AND OVERFILLING

Deleted

~~**6106.1 Attendants.** Dispensing of LP-gas shall be performed by a qualified attendant.~~

~~**6106.2 Overfilling.** LP-gas containers shall not be filled or maintained with LP-gas in excess of either the volume determined using the fixed liquid-level gauge installed in accordance with the manufacturer's specifications and in accordance with Section 5.9.5 of NFPA 58 or the weight determined by the required percentage of the water capacity marked on the container. Portable LP-gas containers shall not be refilled unless equipped with an overfilling prevention device (OPD) where required by Section 5.9.3 of NFPA 58.~~

~~**6106.3 Dispensing locations.** The point of transfer of LP-gas from one LP-gas container to another shall be separated from exposures as specified in NFPA 58.~~

SECTION 6107
SAFETY PRECAUTIONS AND DEVICES

Deleted

~~**6107.1 Safety devices.** Safety devices on LP-gas containers, equipment and systems shall not be tampered with or made ineffective.~~

~~**6107.2 Smoking and other sources of ignition.** "No Smoking" signs complying with Section 310 shall be posted where required by the *fire code official*. Smoking within 25 feet (7620 mm) of a point of transfer, while filling operations are in progress at LP-gas containers or vehicles, shall be prohibited.~~

~~Control of other sources of ignition shall comply with Chapter 3 of this code and Section 6.25 of NFPA 58.~~

~~**6107.3 Clearance to combustibles.** Weeds, grass, brush, trash and other combustible materials shall be kept not less than 10 feet (3048 mm) from LP-gas tanks or containers.~~

~~**6107.4 Protecting containers from vehicles.** Where exposed to vehicular damage due to proximity to alleys, driveways or parking areas, LP-gas containers, regulators and piping shall be protected in accordance with NFPA 58.~~

SECTION 6108
FIRE PROTECTION

Deleted

~~**6108.1 General.** Fire protection shall be provided for installations having LP-gas storage containers with a water capacity of more than 4,000 gallons (15 140 L), as required by Section 6.29 of NFPA 58.~~

~~**6108.2 Portable fire extinguishers.** Portable fire extinguishers complying with Section 906 shall be provided as specified in NFPA 58.~~

SECTION 6109
STORAGE OF PORTABLE LP-GAS CONTAINERS AWAITING USE OR RESALE

Deleted

6109.1 General. Storage of portable LP-gas containers of 1,000 pounds (454 kg) or less, whether filled, partially filled or empty, at consumer sites or distribution points, and for resale by dealers or resellers shall comply with Sections 6109.2 through 6109.15.1.

Exceptions:

1. LP-gas containers that have not previously been in LP-gas service.
2. LP-gas containers at distribution plants.
3. LP-gas containers at consumer sites or distribution points, which are connected for use.

6109.2 Exposure hazards. LP-gas containers in storage shall be located in a manner that minimizes exposure to excessive temperature rise, physical damage or tampering.

6109.3 Position. LP-gas containers in storage having individual water capacity greater than 2.7 pounds (1.2 kg) [nominal 1-pound (0.454 kg) LP-gas capacity] shall be positioned with the pressure relief valve in direct communication with the vapor space of the container.

6109.4 Separation from means of egress. LP-gas containers stored in buildings in accordance with Sections 6109.9 and 6109.11 shall not be located near *exit access* doors, *exits*, *stairways* or in areas normally used, or intended to be used, as a *means of egress*.

6109.5 Quantity. Empty LP-gas containers that have been in LP-gas service shall be considered as full containers for the purpose of determining the maximum quantities of LP-gas allowed in Sections 6109.9 and 6109.11.

6109.6 Storage on roofs. LP-gas containers that are not connected for use shall not be stored on roofs.

6109.7 Storage in basement, pit or similar location. LP-gas containers shall not be stored in a *basement*, pit or similar location where heavier-than-air gas might collect. LP-gas containers shall not be stored in above-grade underfloor spaces or *basements* unless such location is provided with an *approved* means of ventilation.

Exception: Department of Transportation (DOTn) specification cylinders with a maximum water capacity of 2.7 pounds (1.2 kg) for use in completely self-contained hand torches and similar applications. The quantity of LP-gas shall not exceed 20 pounds (9 kg).

6109.8 Protection of valves on LP-gas containers in storage. LP-gas DOTn cylinder valves shall be protected by screw-on-type caps or collars that shall be securely in place on all containers stored regardless of whether they are full, partially full or empty. Container and tank outlet valves shall be closed or plugged.

6109.9 Storage within buildings open to the public. Department of Transportation (DOTn) specification cylinders with maximum water capacity of 2.7 pounds (1.2 kg) used in completely self-contained hand torches and similar applications are allowed to be stored or displayed in a building open to the public. The quantity of LP-gas shall not exceed 200 pounds (91 kg) except as provided in Section 6109.11.

6109.10 Storage within buildings not open to the public. The maximum quantity allowed in one storage location in buildings not open to the public, such as industrial buildings, shall not exceed a water capacity of 735 pounds (334 kg) [nominal 300 pounds (136 kg) of LP-gas]. Where additional storage locations are required on the same floor within the same building, they shall be separated by not less than 300 feet (91 440 mm). Storage beyond these limitations shall comply with Section 6109.11.

6109.10.1 Quantities on equipment and vehicles. LP-gas containers carried as part of service equipment on highway mobile vehicles need not be considered in the total storage capacity in Section 6109.10, provided that such vehicles are stored in private garages and do not carry more than three LP-gas containers with a total aggregate LP-gas capacity not exceeding 100 pounds (45.4 kg) per vehicle. LP-gas container valves shall be closed.

6109.11 Storage within rooms used for gas manufacturing. Storage within buildings or rooms used for gas manufacturing, gas storage, gas-air mixing and vaporization, and compressors not associated with liquid transfer shall comply with Sections 6109.11.1 and 6109.11.2.

6109.11.1 Quantity limits. The maximum quantity of LP-gas shall be 10,000 pounds (4540 kg).

6109.11.2 Construction. The construction of such buildings and rooms shall comply with requirements for Group H occupancies in the *International Building Code*, Chapter 10 of NFPA 58 and both of the following:

1. Adequate vents shall be provided to the outside at both top and bottom, located not less than 5 feet (1524 mm) from building openings.
2. The entire area shall be classified for the purposes of ignition source control in accordance with Section 6.25 of NFPA 58.

6109.12 Location of storage outside of buildings. Storage outside of buildings of LP-gas containers awaiting use, resale or part of a cylinder exchange program shall be located in accordance with Table 6109.12.

TABLE 6109.12
SEPARATION FROM EXPOSURES OF LP-GAS CONTAINERS AWAITING USE, RESALE OR EXCHANGE STORED OUTSIDE OF BUILDINGS

QUANTITY OF LP-GAS STORED (pounds)	MINIMUM SEPARATION DISTANCE FROM STORED LP-GAS CYLINDERS TO (feet):						
	Nearest important building or group of buildings or line of adjoining property that may be built on	Line of adjoining property occupied by schools, places of religious worship, hospitals, athletic fields or other points of public gathering; busy thoroughfares; or sidewalks	LP-gas dispensing station	Doorway or opening to a building with two or more means of egress	Doorway or opening to a building with one means of egress	Combustible materials	Motor vehicle fuel dispenser
720 or less	0	0	5	5	10	10	20
721–2,500	0	10	10	5	10	10	20
2,501–6,000	10	10	10	10	10	10	20
6,001–10,000	20	20	20	20	20	10	20
Over 10,000	25	25	25	25	25	10	20

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

6109.13 Protection of containers. LP-gas containers shall be stored within a suitable enclosure or otherwise protected against tampering. Vehicle impact protection shall be provided as required by Section 6107.4.

Exception: Vehicle impact protection shall not be required for protection of LP-gas containers where the containers are kept in lockable, ventilated cabinets of metal construction.

6109.14 Alternative location and protection of storage. Where the provisions of Sections 6109.12 and 6109.13 are impractical at construction sites, or at buildings or structures undergoing major renovation or repairs, the storage of containers shall be as required by the *fire code official*.

6109.15 LP-gas cylinder exchange for resale. In addition to other applicable requirements of this chapter, facilities operating LP-gas cylinder exchange stations that are open to the public shall comply with the following requirements.

1. Cylinders shall be secured in a lockable, ventilated metal cabinet or other *approved* enclosure.
2. Cylinders shall be available only by authorized personnel or by use of an automated exchange system in accordance with Section 6109.15.1.
3. A sign shall be posted on the entry door of the business operating the cylinder exchange stating "DO NOT BRING LP-GAS CYLINDERS INTO THE BUILDING" or similar *approved* wording.
4. An emergency contact information sign shall be posted within 10 feet (3048 mm) of the cylinder storage cabinet. The content, lettering, size, color and location of the required sign shall be as required by the *fire code official*.

6109.15.1 Automated cylinder exchange stations. Cylinder exchange stations that include an automated vending system for exchanging cylinders shall comply with the following additional requirements:

1. The vending system shall only permit access to a single cylinder per individual transaction.
2. Cabinets storing cylinders shall be designed such that cylinders can only be placed inside when they are oriented in the upright position.
3. Devices operating door releases for access to stored cylinders shall be permitted to be pneumatic, mechanical or electrically powered.
4. Electrical equipment inside of or within 5 feet (1524 mm) of a cabinet storing cylinders, including but not limited to electronics associated with vending operations, shall comply with the requirements for Class I, Division 2, equipment in accordance with NFPA 70.
5. A manual override control shall be permitted for use by authorized personnel. On newly installed cylinder exchange stations, the vending system shall not be capable of returning to automatic operation after a manual override until the system has been inspected and reset by authorized personnel.
6. Inspections shall be conducted by authorized personnel to verify that all cylinders are secured, access doors are closed and the station has no visible damage or obvious defects that necessitate placing the station out of service. The frequency of inspections shall be as specified by the *fire code official*.

SECTION 6110
LP-GAS CONTAINERS NOT IN SERVICE

Deleted

6110.1 Removed from service. LP-gas containers whose use has been discontinued shall comply with all of the following:

1. Be disconnected from appliance piping.
2. Have LP-gas container outlets, except relief valves, closed or plugged.
3. Be positioned with the relief valve in direct communication with the LP-gas container vapor space.

6110.2 Removal from site. LP-gas containers discontinued from service shall be removed from the site.

SECTION 6111
PARKING AND GARAGING OF LP-GAS TANK VEHICLES

6111.1 General. Parking of LP-gas tank vehicles shall comply with Sections 6111.2, and 6111.3 and Chapter 9 of NFPA 58.

Exception: In cases of accident, breakdown or other emergencies, LP-gas tank vehicles are allowed to be parked and left unattended at any location while the operator is obtaining assistance.

CHAPTER 62
ORGANIC PEROXIDES

User note:

About this chapter: *Chapter 62 addresses the hazards associated with the storage, handling and use of organic peroxides and is intended to manage the fire and oxidation hazards of organic peroxides by preventing their uncontrolled release. These chemicals possess the characteristics of flammable or combustible liquids and are also strong oxidizers. This unusual combination of properties requires special storage and handling precautions to prevent uncontrolled release, contamination, hazardous chemical reactions, fires or explosions. The requirements of this chapter pertain to industrial applications in which significant quantities of organic peroxides are stored or used; however, smaller quantities of organic peroxides still pose a significant hazard and, therefore, must be stored and used in accordance with the applicable provisions of this chapter and Chapter 50.*

CHAPTER 63
OXIDIZERS, OXIDIZING GASES AND OXIDIZING CRYOGENIC FLUIDS

User note:

About this chapter: *Chapter 63 addresses the hazards associated with solid, liquid, gaseous and cryogenic fluid oxidizing materials, including oxygen in home use, and establishes criteria for their safe storage and protection in indoor and outdoor storage facilities, minimizing the potential for uncontrolled releases and contact with fuel sources. Although oxidizers themselves do not burn, they pose unique fire hazards because of their ability to support combustion by breaking down and giving off oxygen.*

CHAPTER 64
PYROPHORIC MATERIALS

User note:

About this chapter: *Chapter 64 regulates the hazards associated with pyrophoric materials, which are capable of spontaneously igniting in the air at or below a temperature of 130°F (54°C). Many pyrophoric materials also pose severe flammability or reactivity hazards. This chapter addresses only the hazards associated with pyrophoric materials. Materials that pose multiple hazards must conform to the requirements of this code with respect to all hazards.*

CHAPTER 65
PYROXYLIN (CELLULOSE NITRATE) PLASTICS

User note:

About this chapter: *Chapter 65 addresses the significant hazards associated with pyroxylin (cellulose nitrate) plastics, which are the most dangerous and unstable of all plastic compounds. The chemically bound oxygen in their structure permits them to burn vigorously in the absence of atmospheric oxygen at a rate 15 times greater than comparable common combustibles. Strict compliance with the provisions of this chapter, along with proper housekeeping and storage arrangements, helps to reduce the hazards associated with pyroxylin (cellulose nitrate) plastics in a fire or other emergencies.*

CHAPTER 66
UNSTABLE (REACTIVE) MATERIALS

User note:

About this chapter: *Chapter 66 addresses the hazards of unstable (reactive) liquid and solid materials as well as unstable (reactive) compressed gases. In addition to their unstable reactivity, these materials may pose other hazards, such as toxicity, corrosivity, explosivity, flammability or oxidizing potential. This chapter, however, is intended to address those materials whose primary hazard is unstable reactivity. Materials that pose multiple hazards must conform to the requirements of the code with respect to all hazards. Strict compliance with the provisions of this chapter, along with proper housekeeping and storage arrangements, helps to reduce the exposure hazards associated with unstable (reactive) materials in a fire or other emergency.*

CHAPTER 67
WATER-REACTIVE SOLIDS AND LIQUIDS

User note:

About this chapter: *Chapter 67 addresses the hazards associated with water-reactive materials that are solid or liquid at normal temperatures and pressures. In addition to their water reactivity, these materials may pose a wide range of other hazards, such as toxicity, flammability, corrosiveness or oxidizing potential. This chapter addresses only those materials whose primary hazard is water reactivity. Materials that pose multiple hazards must conform to the requirements of this code with respect to all hazards. Strict compliance with the requirements of this chapter, along with proper housekeeping and storage arrangements, helps to reduce the exposure to hazards associated with water-reactive materials in a fire or other emergency.*

Part VI—Referenced Standards

CHAPTER 80

REFERENCED STANDARDS

User note:

About this chapter: *This code contains numerous references to standards promulgated by other organizations that are used to provide requirements for materials and methods of construction. This chapter contains a comprehensive list of all standards that are referenced in this code. These standards, in essence, are part of this code to the extent of the reference to the standard.*

This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title, and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in Section 102.7.

ASME

A17.3—2020

Safety Code for Existing Elevators and Escalators

~~1103.3.1, 1103.3.2~~ Deleted

ASTM

E1354—17

Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter

304.3.2, 304.3.4, 304.4.2.3, 318.1, 808.1, 808.2, 2310.5.3, 3305.2.3, 3305.9, 3603.4

ICC

IBC—21

International Building Code®

201.3, 202, 304.1.3, 306.1, 311.1.1, 311.3, 313.1, 317.1, 403.7.3.4, 403.10.4, 404.2.1, 504.1, 508.1, 508.1.2, 510.5.1, 603.1, 604.1, 604.4, 604.5, 604.5.1, 604.5.2, 604.5.3, 604.5.4, 605.2.1.1, 605.3, 605.4.2.6, 605.6.2, 605.8, 701.1, 701.6, 801.1, 803.1, Table 803.3, 803.11.1, 803.11.2, 803.15, 807.2, 807.5.1.2, 808.1, 808.2, 808.5, 901.4, 901.4.1, 901.4.2, 901.4.3, 901.4.4, 903.2, 903.2.5.2, 903.2.9.1, 903.2.10, 903.3.1.1.1, 903.3.1.2, 903.3.1.2.1, 903.3.1.2.3, 903.3.2, 904.14, 907.1.1, 907.2.1, 907.2.6.2, 907.2.6.3.3, 907.2.7, 907.2.13, 907.2.18, 907.2.21, 907.5.2.1, 907.6.6, 909.1, 909.2, 909.3, 909.4.3, 909.5, 909.5.3, 909.5.3.1, 909.5.3.2, 909.6.3, 909.10.5, 909.11.1, 909.18.8, 909.20.2, 909.20.2.1, 909.20.3.1, 909.20.3.2, 909.20.6.1, 909.21.1, 910.4.5, Table 911.1, 911.2, 913.2.1, 914.1,

914.2.1, 914.3.1, 914.3.2, 914.4.1, 914.5.3, Table 914.8.3, 914.8.3.2, 914.10, 915.1.6, 1003.2, 1003.5, Table 1004.5, 1004.6, 1005.7.2, 1006.2.1, Table 1006.2.1, 1008.3.4, 1009.2, 1009.4.1, 1009.4.2, 1009.5, 1009.6.4, 1009.7.2, 1010.1.4, 1010.1.6, 1010.2.2, 1010.2.7, 1010.3.1, 1010.3.3, 1011.7, 1011.10, 1011.11, 1011.12.2, 1012.6.3, 1012.6.4, 1014.1, 1015.2, 1015.2.1, 1016.2, Table 1017.2, 1018.3, 1018.5, 1019.3, 1019.4, 1020.2, Table 1020.2, 1020.2.1, 1021.4, 1023.2, 1023.3.1, 1023.4, 1023.5, 1023.6, 1023.7, 1023.12, 1023.12.1, 1023.12.2, 1024.3, 1024.5, 1024.6, 1024.7, 1024.8, 1026.2, 1026.3, 1026.4.1, 1027.5, 1028.2, 1030.1.1.1, 1030.14.1, 1030.16.4, 1031.5.3, ~~1101.2, 1101.3, 1103.3.2, 1103.4.1, 1103.4.8, 1103.4.9.1, 1103.4.9.2.1, 1103.4.9.2.2, 1103.4.9.4, 1103.4.9.5, 1103.4.10, 1103.5.4, 1104.5, 1104.17, 1104.17.1, 1104.18, Table 1104.18, 1105.4.1, 1105.4.3.1, 1105.4.3.2, 1105.5.7, 1105.7.2, 1105.7.3, 1105.7.4, 1105.7.5, 1105.7.6, 1105.8,~~ 1203.1, 1203.1.3, 1203.1.8, 1203.2.1, 1203.2.8, 1203.2.9, 1203.2.11, 1203.2.16, 1203.2.19, 1205.1, 1206.6.2, 1207.4.4, 1207.7.4, 1207.9.2, 1207.11.3, 2004.6, 2006.17, 2007.1, 2007.4, 2103.3, 2107.1, 2301.1, 2301.4, 2303.1, 2307.4, 2308.3, 2308.3.1, 2309.3.1.5.1, 2309.3.2, 2310.1, 2311.1, 2311.3.1, 2311.4.1, 2311.8.3, 2404.2, 2404.3.1, 2404.3.3.6, 2404.3.4, 2405.2, 2701.1, 2701.4, 2703.2.2, 2703.3.1, 2703.3.2, 2703.3.4, 2703.3.8, 2703.14, 2703.14.1, 2703.14.2, 2703.15.1, 2704.3.1, 2705.2.3.2, 2705.3.1, 2705.3.2.1, 2705.3.3, 2803.1, 2905.1, 2909.2, 2909.4, 2909.6, 3101.1, 3103.1, 3103.3.1, 3103.8.2, 3103.8.4, 3103.9.1, 3103.9.2, 3103.9.3, 3104.1, 3105.5, 3201.3, 3206.3.2, 3206.9, 3207.2, 3208.1.1, 3208.2, 3315.1, 3403.1, 3704.3, 3704.4, 3704.5, 3801.1, 3801.2, 3804.1, 3804.1.1.1, Table 3805.4, Table 3806.2.1, 3901.1, 3903.1, 3904.1, 5003.2.2.2, 5003.2.8, 5003.8.1, Table 5003.8.2, 5003.8.3, 5003.8.3.1, 5003.8.4.1, 5003.9.9, 5004.13, 5005.2, 5005.3.9, 5101.1, 5303.16.1, 5303.16.2, 5306.1, 5306.2, 5306.2.1, 5306.2.2, 5307.4.6, 5503.1.2, 5503.5.2, 5504.2.1.2, 5504.2.2.2, 5505.4.1, 5604.2, Table 5604.5.2(3), 5605.5, 5701.3, 5704.2.7.7, 5704.2.8.1, 5704.2.8.2, 5704.2.9.3, 5704.2.9.4, 5704.3.3.5, 5704.3.7.1, 5704.3.8, 5705.3.4, 5705.3.5.3, 5705.3.7.1, 5705.3.7.2, 5705.3.7.3, 5705.3.7.4, 5705.3.7.5.1, 5706.2.3, 5706.4.1, 5803.1.1, 5806.4.3, 5808.1, 5808.3, 5808.3.2, 5906.2.2, 5906.2.3, 5906.4.2, 6003.1.4.2, 6005.3.1, 6109.11.2, 6204.1.2, 6306.4, 6404.1.4, 6604.1

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International Existing Building Code®

102.3, 1011.5.2, ~~1103.1, 1104.18, 1105.5.2~~

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

02—~~19~~ 20

Hydrogen Technologies Code

1206.3, 1206.4, 2309.1, 2309.3.1.1, 2309.3.1.2, 2309.4, 2309.6, 2311.8, 2311.8.2, 2311.8.10, 2311.8.11, 5301.1, 5801.1

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Standard for Portable Fire Extinguishers

Table 901.6.1, 906.2, Table 906.3(1), Table 906.3(2), 906.3.2, 906.3.4, 3006.3

13—19

Standard for the Installation of Sprinkler Systems

903.3.1.1, 903.3.2, 903.3.8.2, 903.3.8.5, 904.13, 905.3.4, 907.6.4, 914.3.2, 1019.3, 1019.3, ~~1103.4.8~~, 3201.1, 3204.2, 3205.5, Table 3206.2, 3206.4.1, 3206.10, 3207.2, 3207.2.1, 3208.2.2, 3208.2.2.1, 3208.4, 3210.1, 3401.1, 5104.1, 5104.1.1, 5106.5.7, 5704.3.3.9, Table 5704.3.6.3(7), 5704.3.7.5.1, 5704.3.8.4

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905.2, 905.3.4, 905.4.2, 905.6.2, 905.8

17—~~20~~ 21

Standard for Dry Chemical Extinguishing Systems
Table 901.6.1, 904.6, 904.13

17A—~~20~~ 21

Standard for Wet Chemical Extinguishing Systems
Table 901.6.1, 904.5, 904.13

25—~~20~~ 23

Standard for the Inspection, Testing and Maintenance of Water-based Fire Protection Systems
507.5.3, Table 901.6.1, 901.7, 904.7.1, 912.7, 913.5

55—~~19~~ 20

Compressed Gases and Cryogenic Fluids Code
3508.1, 5301.1, 5307.4.2, 5501.1, 5801.1, 6301.1

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National Fire Alarm and Signaling Code
508.1.6, Table 901.6.1, 903.4.1, 904.3.5, 907.1.2, 907.2, 907.2.6, 907.2.9.3, 907.2.11, 907.2.13.2, 907.3, 907.3.3, 907.3.4, 907.5.2.1.2, 907.5.2.1.3, 907.5.2.1.3.2, 907.5.2.2, 907.5.2.2.5, 907.6, 907.6.1, 907.6.2, 907.6.6, 907.7, 907.7.1, 907.7.2, 907.8, 907.8.2, 907.8.4, 915.5.1, 915.5.2, 915.6, 917.1, ~~1103.3.2~~, 1203.2.4, 1207.5.4, 1207.6.1.2.3, 1207.6.1.2.4, Table 1207.7, 2810.11

96—~~20~~ 21

Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
606.2, 904.13

99—21

Health Care Facilities Code
603.1.2, 603.5.1.1, 609.1, ~~1105.11.1, 1105.11.2~~, 1203.4.1, 1203.5.1, 5003.7.4, 5306.4, 5306.5

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Standard for Heliports

2007.6

505—18

Fire Safety Standard for Powered Industrial Trucks, Including Type Designations, Areas of Use, Maintenance and Operation
309.2, 2203.4.5, 4003.3.3

~~**720—15**~~

~~**Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment**~~
~~915.5.1, 915.5.2, 915.6~~

914—19

Code for Fire Protection of Historic Structures
~~1103.1.1~~ 102.6

1142—17

Standard on Water Supplies for Suburban and Rural Fire Fighting
~~B103.3,~~ 507.3.2.1, 511.2.1

1225—22

Standard for the Installation, Maintenance and Use of Emergency Services Communications Systems
510.4.2, 510.5, 510.5.4#1

710—2012

Exhaust Hoods for Commercial Cooking Equipment—with revisions through June 2018
606.2

Part VII—Appendices

APPENDIX A

BOARD OF APPEALS

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The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

User note:

About this appendix: *Appendix A contains optional criteria that, when adopted, provide jurisdictions with detailed appeals, board member qualifications and administrative procedures to supplement the basic requirements found in Section 111 of this code.*

SECTION A101
GENERAL

A101.1 Scope. A board of appeals shall be established within the jurisdiction for the purpose of hearing applications for modification of the requirements of this code pursuant to the provisions of Section 111. The board shall be established and operated in accordance with this section, and shall be authorized to hear evidence from appellants and the *fire code official* pertaining to the application and intent of this code for the purpose of issuing orders pursuant to these provisions.

A101.2 Application for appeal. Any person shall have the right to appeal a decision of the *fire code official* to the board. An application for appeal shall be based on a claim that the intent of this code or the rules legally adopted hereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the *fire code official* within 20 days after the notice was served.

A101.2.1 Limitation of authority. The board shall not have authority to waive requirements of this code or interpret the administration of this code.

A101.2.2 Stays of enforcement. Appeals of notice and orders, other than Imminent Danger notices, shall stay the enforcement of the notice and order until the appeal is heard by the board.

A101.3 Membership of board. The board shall consist of five voting members appointed by the chief appointing authority of the jurisdiction. Each member shall serve for **[NUMBER OF YEARS]** years or until a successor has been appointed. The board member's terms shall be staggered at intervals, so as to provide continuity. The *fire code official* shall be an ex officio member of said board but shall not vote on any matter before the board.

A101.3.1 Qualifications. The board shall consist of members who are qualified by experience and training to pass on matters pertaining to hazards of fire, explosions, hazardous conditions or *fire protection systems*, and are not employees of the jurisdiction.

A101.3.2 Alternate members. The chief appointing authority is authorized to appoint two alternate members who shall be called by the board chairperson to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership, and shall be appointed for the same term or until a successor has been appointed.

A101.3.3 Vacancies. Vacancies shall be filled for an unexpired term in the same manner in which original appointments are required to be made.

A101.3.4 Chairperson. The board shall annually select one of its members to serve as chairperson.

A101.3.5 Secretary. The chief appointing authority shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings, which shall set forth the reasons for the board's decision, the vote of each member, the absence of a member and any failure of a member to vote.

A101.3.6 Conflict of interest. A member with any personal, professional or financial interest in a matter before the board shall declare such interest and refrain from participating in discussions, deliberations and voting on such matters.

A101.3.7 Compensation of members. Compensation of members shall be determined by law.

A101.3.8 Removal from the board. A member shall be removed from the board prior to the end of their terms only for cause. Any member with continued absence from regular meetings of the board may be removed at the discretion of the chief appointing authority.

A101.4 Rules and procedures. The board shall establish policies and procedures necessary to carry out its duties consistent with the provisions of this code and applicable state law. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be presented.

A101.5 Notice of meetings. The board shall meet upon notice from the chairperson within 10 days of the filing of an appeal or at stated periodic intervals.

A101.5.1 Open hearing. All hearings before the board shall be open to the public. The appellant, the appellant's representative, the *fire code official* and any person whose interests are affected shall be given an opportunity to be heard.

A101.5.2 Quorum. Three members of the board shall constitute a quorum.

A101.5.3 Postponed hearing. When five members are not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

A101.6 Legal counsel. The jurisdiction shall furnish legal counsel to the board to provide members with general legal advice concerning matters before them for consideration. Members shall be represented by legal counsel at the jurisdiction's expense in all matters arising from service within the scope of their duties.

A101.7 Board decision. The board shall only modify or reverse the decision of the *fire code official* by a concurring vote of three or more members.

A101.7.1 Resolution. The decision of the board shall be by resolution. Every decision shall be promptly filed in writing in the office of the *fire code official* within three days and shall be open to the public for inspection. A certified copy shall be furnished to the appellant or the appellant's representative and to the *fire code official*.

A101.7.2 Administration. The *fire code official* shall take immediate action in accordance with the decision of the board.

A101.8 Court review. Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

FIRE-FLOW REQUIREMENTS FOR BUILDINGS

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The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

User note:

About this appendix: *Appendix B provides a tool for the use of jurisdictions in establishing a policy for determining fire-flow requirements in accordance with Section 507.3. The determination of required fire flow is not an exact science, but having some level of information provides a consistent way of choosing the appropriate fire flow for buildings throughout a jurisdiction. The primary tool used in this appendix is a table that presents fire flow based on construction type and building area based on the correlation of the Insurance Services Office (ISO) method and the construction types used in the* International Building Code®.

SECTION B101
GENERAL

B101.1 Scope. The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix. This appendix does not apply to structures other than buildings.

SECTION B102
DEFINITIONS

B102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

FIRE FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for fire fighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m^2), used to determine the required fire flow.

SECTION B103
MODIFICATIONS

B103.1 Decreases. The *fire code official* is authorized to reduce the *fire flow* requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full *fire flow* requirements is impractical.

B103.2 Increases. The *fire code official* is authorized to increase the *fire flow* requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall be not more than twice that required for the building under consideration.

B103.3 Areas without water supply systems. For information regarding water supplies for fire fighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the *fire code official* is authorized to utilize NFPA 1142 or the *International Wildland-Urban Interface Code*.

SECTION B104
FIRE-FLOW CALCULATION AREA

B104.1 General. The *fire-flow calculation area* shall be the total floor area of all floor levels within the *exterior walls*, and under the horizontal projections of the roof of a building, except as modified in Section B104.3.

B104.2 Area separation. Portions of buildings that are separated by *fire walls* without openings, constructed in accordance with the *International Building Code*, are allowed to be considered as separate *fire-flow calculation areas*.

B104.3 Type IA and Type IB construction. The *fire-flow calculation area* of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.

Exception: *Fire-flow calculation area* for open parking garages shall be determined by the area of the largest floor.

SECTION B105
FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.1 One- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum *fire flow* and flow duration requirements for one- and two-family *dwellings*, Group R-3 and R-4 buildings and *townhouses* shall be as specified in Tables B105.1(1) and B105.1(2).

TABLE B105.1(1)
REQUIRED FIRE FLOW FOR ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

FIRE-FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
0–3,600	No automatic sprinkler system	1,000	1
3,601 and greater	No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2) at the required fire-flow rate
0–3,600	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	500	½
3,601 and greater	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	½ value in Table B105.1(2)	1

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m.

TABLE B105.1(2)
REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
0–22,700	0–12,700	0–8,200	0–5,900	0–3,600	1,500	2
22,701–30,200	12,701–17,000	8,201–10,900	5,901–7,900	3,601–4,800	1,750	
30,201–38,700	17,001–21,800	10,901–12,900	7,901–9,800	4,801–6,200	2,000	
38,701–48,300	21,801–24,200	12,901–17,400	9,801–12,600	6,201–7,700	2,250	
48,301–59,000	24,201–33,200	17,401–21,300	12,601–15,400	7,701–9,400	2,500	
59,001–70,900	33,201–39,700	21,301–25,500	15,401–18,400	9,401–11,300	2,750	
70,901–83,700	39,701–47,100	25,501–30,100	18,401–21,800	11,301–13,400	3,000	3
83,701–97,700	47,101–54,900	30,101–35,200	21,801–25,900	13,401–15,600	3,250	
97,701–112,700	54,901–63,400	35,201–40,600	25,901–29,300	15,601–18,000	3,500	
112,701–128,700	63,401–72,400	40,601–46,400	29,301–33,500	18,001–20,600	3,750	
128,701–145,900	72,401–82,100	46,401–52,500	33,501–37,900	20,601–23,300	4,000	4
145,901–164,200	82,101–92,400	52,501–59,100	37,901–42,700	23,301–26,300	4,250	
164,201–183,400	92,401–103,100	59,101–66,000	42,701–47,700	26,301–29,300	4,500	
183,401–203,700	103,101–114,600	66,001–73,300	47,701–53,000	29,301–32,600	4,750	

203,701–225,200	114,601–126,700	73,301–81,100	53,001–58,600	32,601–36,000	5,000
225,201–247,700	126,701–139,400	81,101–89,200	58,601–65,400	36,001–39,600	5,250
247,701–271,200	139,401–152,600	89,201–97,700	65,401–70,600	39,601–43,400	5,500
271,201–295,900	152,601–166,500	97,701–106,500	70,601–77,000	43,401–47,400	5,750
295,901–Greater	166,501–Greater	106,501–115,800	77,001–83,700	47,401–51,500	6,000
—	—	115,801–125,500	83,701–90,600	51,501–55,700	6,250
—	—	125,501–135,500	90,601–97,900	55,701–60,200	6,500
—	—	135,501–145,800	97,901–106,800	60,201–64,800	6,750
—	—	145,801–156,700	106,801–113,200	64,801–69,600	7,000
—	—	156,701–167,900	113,201–121,300	69,601–74,600	7,250
—	—	167,901–179,400	121,301–129,600	74,601–79,800	7,500
—	—	179,401–191,400	129,601–138,300	79,801–85,100	7,750
—	—	191,401–Greater	138,301–Greater	85,101–Greater	8,000

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.
a. Types of construction are based on the *International Building Code*.
b. Measured at 20 psi residual pressure.

B105.2 Buildings other than one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum *fire flow* and flow duration for buildings other than one- and two-family *dwellings*, Group R-3 and R-4 buildings and *townhouses* shall be as specified in Tables B105.1(2) and B105.2.

TABLE B105.2
REQUIRED FIRE FLOW FOR BUILDINGS OTHER THAN ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2)
Section 903.3.1.1 of the *International Fire Code*	25% of the value in Table B105.1(2)[a]	Duration in Table B105.1(2) at the reduced flow rate
Section 903.3.1.2 of the *International Fire Code*	25% of the value in Table B105.1(2)[b]	Duration in Table B105.1(2) at the reduced flow rate

For SI: 1 gallon per minute = 3.785 L/m.
a. The reduced fire flow shall be not less than 1,000 gallons per minute.
b. The reduced fire flow shall be not less than 1,500 gallons per minute.

B105.3 Water supply for buildings equipped with an automatic sprinkler system. For buildings equipped with an *approved automatic sprinkler system*, the water supply shall be capable of providing the greater of:

1. The *automatic sprinkler system* demand, including hose stream allowance.
2. The required *fire flow*.

SECTION B106
REFERENCED STANDARDS

B106.1 General. See Table B106.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

TABLE B106.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
IBC—21	*International Building Code*	B104.2
IRC—21	*International Residential Code*	Table B105.1(1)
IWUIC—21	*International Wildland-Urban Interface Code*	B103.3
NFPA 1142—17	*Standard on Water Supplies for Suburban and Rural Fire Fighting*	B103.3

APPENDIX C

FIRE HYDRANT LOCATIONS AND DISTRIBUTION

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

User note:

About this appendix: *Appendix C focuses on the location and spacing of fire hydrants, which is important to the success of fire-fighting operations. The difficulty with determining the spacing of fire hydrants is that every situation is unique and has unique challenges. Finding one methodology for determining hydrant spacing is difficult. This particular appendix gives one methodology based on the required fire flow that fire departments can work with to set a policy for hydrant distribution around new buildings and facilities in conjunction with Section 507.5.*

APPENDIX D

FIRE APPARATUS ACCESS ROADS

Deleted

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

User note:

About this appendix: *Appendix D contains more detailed elements for use with the basic access requirements found in Section 503, which gives some minimum criteria, such as a maximum length of 150 feet and a minimum width of 20 feet, but in many cases does not state specific criteria. This appendix, like Appendices B and C, is a tool for jurisdictions looking for guidance in establishing access requirements and includes criteria for multiple-family residential developments, large one- and two-family subdivisions, specific examples for various types of turnarounds for fire department apparatus and parking regulatory signage.*

SECTION D101
GENERAL

D101.1 Scope. Fire apparatus access roads shall be in accordance with this appendix and all other applicable requirements of the *International Fire Code*.

SECTION D102
REQUIRED ACCESS

D102.1 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall be accessible to fire department apparatus by way of an *approved* fire apparatus access road with an asphalt, concrete or other *approved* driving surface capable of supporting the imposed load of fire apparatus weighing not less than up to 75,000 pounds (34 050 kg).

SECTION D103
MINIMUM SPECIFICATIONS

D103.1 Access road width with a hydrant. Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet (7925 mm), exclusive of shoulders (see Figure D103.1).

D103.2 Grade. Fire apparatus access roads shall not exceed 10 percent in grade.

Exception: Grades steeper than 10 percent as *approved* by the *fire code official*.

D103.3 Turning radius. The minimum turning radius shall be determined by the *fire code official*.

D103.4 Dead ends. Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) shall be provided with width and turnaround provisions in accordance with Table D103.4.

TABLE D103.4
REQUIREMENTS FOR DEAD-END FIRE APPARATUS ACCESS ROADS

LENGTH (feet)	WIDTH (feet)	TURNAROUNDS REQUIRED
0–150	20	None required
151–500	20	120-foot Hammerhead, 60-foot "Y" or 96-foot-diameter cul-de-sac in accordance with Figure D103.1

501–750	26	120-foot Hammerhead, 60-foot "Y" or 96-foot-diameter cul-de-sac in accordance with Figure D103.1
Over 750	Special approval required	

For SI: 1 foot = 304.8 mm.

D103.5 Fire apparatus access road gates. Gates securing the fire apparatus access roads shall comply with all of the following criteria:

1. Where a single gate is provided, the gate width shall be not less than 20 feet (6096 mm). Where a fire apparatus road consists of a divided roadway, the gate width shall be not less than 12 feet (3658 mm).
2. Gates shall be of the horizontal swing, horizontal slide, vertical lift or vertical pivot type.
3. Construction of gates shall be of materials that allow manual operation by one person.
4. Gate components shall be maintained in an operative condition at all times and replaced or repaired when defective.
5. Electric gates shall be equipped with a means of opening the gate by fire department personnel for emergency access. Emergency opening devices shall be *approved* by the *fire code official*.
6. Methods of locking shall be submitted for approval by the *fire code official*.
7. Electric gate operators, where provided, shall be *listed* in accordance with UL 325.
8. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F2200.

D103.6 Signs. Where required by the *fire code official*, fire apparatus access roads shall be marked with permanent "NO PARKING—FIRE LANE" signs complying with Figure D103.6. Signs shall have a minimum dimension of 12 inches (305 mm) wide by 18 inches (457 mm) high and have red letters on a white reflective background. Signs shall be posted on one or both sides of the fire apparatus road as required by Section D103.6.1 or D103.6.2.

D103.6.1 Roads 20 to 26 feet in width. *Fire lane* signs as specified in Section D103.6 shall be posted on both sides of fire apparatus access roads that are 20 to 26 feet wide (6096 to 7925 mm).

D103.6.2 Roads more than 26 feet in width. *Fire lane* signs as specified in Section D103.6 shall be posted on one side of fire apparatus access roads more than 26 feet wide (7925 mm) and less than 32 feet wide (9754 mm).

SECTION D104
COMMERCIAL AND INDUSTRIAL DEVELOPMENTS

D104.1 Buildings exceeding three stories or 30 feet in height. Buildings or facilities exceeding 30 feet (9144 mm) or three stories in height shall have not fewer than two means of fire apparatus access for each structure.

D104.2 Buildings exceeding 62,000 square feet in area. Buildings or facilities having a gross *building area* of more than 62,000 square feet (5760 m^2) shall be provided with two separate and *approved* fire apparatus access roads.

Exception: Projects having a gross *building area* of up to 124,000 square feet (11 520 m^2) that have a single *approved* fire apparatus access road where all buildings are equipped throughout with *approved automatic sprinkler systems*.

D104.3 Remoteness. Where two fire apparatus access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the lot or area to be served, measured in a straight line between accesses.

SECTION D105
AERIAL FIRE APPARATUS ACCESS ROADS

D105.1 Where required. Where the vertical distance between the *grade plane* and the highest roof surface exceeds 30 feet (9144 mm), *approved* aerial fire apparatus access roads shall be provided. For purposes of this section, the highest roof surface shall be determined by measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater.

Exception: Where *approved* by the *fire code official*, buildings of Type IA, Type IB or Type IIA construction equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 and having fire fighter access through an enclosed *stairway* with a Class I standpipe from the lowest level of fire department vehicle access to all roof surfaces.

D105.2 Width. Aerial fire apparatus access roads shall have a minimum unobstructed width of 26 feet (7925 mm), exclusive of shoulders, in the immediate vicinity of the building or portion thereof.

D105.3 Proximity to building. One or more of the required access routes meeting this condition shall be located not less than 15 feet (4572 mm) and not greater than 30 feet (9144 mm) from the building, and shall be positioned parallel to one entire side of the building. The side of the building on which the aerial fire apparatus access road is positioned shall be *approved* by the *fire code official*.

D105.4 Obstructions. Overhead utility and power lines shall not be located over the aerial fire apparatus access road or between the aerial fire apparatus road and the building. Other obstructions shall be permitted to be placed with the approval of the *fire code official*.

SECTION D106
MULTIPLE-FAMILY RESIDENTIAL DEVELOPMENTS

D106.1 Projects having more than 100 dwelling units. Multiple-family residential projects having more than 100 *dwelling units* shall be equipped throughout with two separate and *approved* fire apparatus access roads.

Exception: Projects having up to 200 *dwelling units* shall have not fewer than one *approved* fire apparatus access road where all buildings, including nonresidential occupancies, are equipped throughout with *approved automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2.

D106.2 Projects having more than 200 dwelling units. Multiple-family residential projects having more than 200 *dwelling units* shall be provided with two separate and *approved* fire apparatus access roads regardless of whether they are equipped with an *approved automatic sprinkler system*.

D106.3 Remoteness. Where two fire apparatus access roads are required, they shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.

SECTION D107
ONE- OR TWO-FAMILY RESIDENTIAL DEVELOPMENTS

D107.1 One- or two-family dwelling residential developments. Developments of one- or two-family *dwellings* where the number of *dwelling units* exceeds 30 shall be provided with two separate and *approved* fire apparatus access roads.

Exceptions:

1. Where there are more than 30 *dwelling units* accessed from a single public or private fire apparatus access road and all *dwelling units* are equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3, access from two directions shall not be required.
2. The number of *dwelling units* accessed from a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with future development, as determined by the *fire code official*.

D107.2 Remoteness. Where two fire apparatus access roads are required, they shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.

SECTION D108
REFERENCED STANDARDS

D108.1 General. See Table D108.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

TABLE D108.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
ASTM F2200—14	*Standard Specification for Automated Vehicular Gate Construction*	D103.5
UL 325—02	*Door, Drapery, Gate, Louver, and Window Operators and Systems*, with Revisions through May 2015	D103.5

PPENDIX E

HAZARD CATEGORIES

This appendix is for information purposes and is not intended for adoption.

User note:

About this appendix: *Appendix E contains guidance for designers, engineers, architects, code officials, plans reviewers and inspectors in the classifying of hazardous materials so that proposed designs can be evaluated intelligently and accurately. The descriptive materials and explanations of hazardous materials and how to report and evaluate them on a Safety Data Sheet (SDS) are intended to be instructional as well as informative. Note that Safety Data Sheets also include the concept known as Material Safety Data Sheets (MSDS).*

APPENDIX F

HAZARD RANKING

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

User note:

About this appendix: *Appendix F is intended to be a companion to the specific requirements of Chapters 51 through 67, which regulate the storage, handling and use of all hazardous materials classified as either physical or health hazards. These materials pose diverse hazards, including instability, reactivity, flammability, oxidizing potential or toxicity; therefore, identifying them by hazard ranking is essential. This appendix lists the various hazardous material categories that are defined in this code, along with the NFPA 704 hazard ranking for each.*

APPENDIX G

CRYOGENIC FLUIDS—WEIGHT AND VOLUME EQUIVALENTS

This appendix is for information purposes and is not intended for adoption.

~~**User note:**~~

~~***About this appendix:*** *Appendix G gives the fire code official and registered design professional a ready reference tool for the conversion of the liquid weight and volume of cryogenic fluid to their corresponding volume of gas and vice versa and is a companion to the provisions of Chapter 55 of this code.*~~

APPENDIX H
HAZARDOUS MATERIALS MANAGEMENT PLAN (HMMP) AND HAZARDOUS MATERIALS INVENTORY STATEMENT (HMIS) INSTRUCTIONS

The provisions contained in this appendix are adopted as part of this code.

~~*The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.*~~

~~**User note:**~~

~~***About this appendix:** Appendix H is intended to assist businesses in establishing a Hazardous Materials Management Plan (HMMP) and Hazardous Materials Inventory Statement (HMIS) based on the classification and quantities of materials that would be found on-site in storage or use. The sample forms and available Safety Data Sheets (SDS) provide the basis for the evaluations. It is also a companion to Sections 407.5 and 407.6, which provide the requirement that the HMIS and HMMP be submitted where required by the fire code official.*~~

APPENDIX I

FIRE PROTECTION SYSTEMS—NONCOMPLIANT CONDITIONS

Deleted

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

User note:

About this appendix: *Appendix I, which was developed by the ICC Hazard Abatement in Existing Buildings Committee, is intended to provide the fire code official with a list of conditions that are readily identifiable by the inspector during the course of an inspection utilizing this code. The specific conditions identified in this appendix are primarily derived from applicable NFPA standards and pose a hazard to the proper operation of the respective systems. While these do not represent all of the conditions that pose a hazard or otherwise may impair the proper operation of fire protection systems, their identification in this adoptable appendix will provide a more direct path for enforcement by the fire code official.*

SECTION I101
NONCOMPLIANT CONDITIONS

I101.1 General. This appendix is intended to identify conditions that can occur where *fire protection systems* are not properly maintained or components have been damaged. This appendix is not intended to provide comprehensive inspection, testing and maintenance requirements, which are found in NFPA 10, 25 and 72. Rather, it is intended to identify problems that are readily observable during fire inspections.

I101.2 Noncompliant conditions requiring component replacement. The following conditions shall be deemed noncompliant and shall cause the related component(s) to be replaced to comply with the provisions of this code:

1. Sprinkler heads having any of the following conditions:
    - 1.1. Signs of leakage.
    - 1.2. Paint or other ornamentation that is not factory applied.
    - 1.3. Evidence of corrosion including, but not limited to, discoloration or rust.
    - 1.4. Deformation or damage of any part.
    - 1.5. Improper orientation of sprinkler head.
    - 1.6. Empty glass bulb.
    - 1.7. Sprinkler heads manufactured prior to 1920.
    - 1.8. Replacement sprinkler heads that do not match existing sprinkler heads in orifice size, K-factor temperature rating, coating or deflector type.
    - 1.9. Sprinkler heads for the protection of cooking equipment that have not been replaced within one year.
2. Water pressure and air pressure gauges that have been installed for more than 5 years and have not been tested to within 3 percent accuracy.

I101.3 Noncompliant conditions requiring component repair or replacement. The following shall be deemed noncompliant conditions and shall cause the related component(s) to be repaired or replaced to comply with the provisions of this code:

1. Sprinkler and standpipe system piping and fittings having any of the following conditions:
    - 1.1. Signs of leakage.
    - 1.2. Evidence of corrosion.
    - 1.3. Misalignment.

1.4. Mechanical damage.

2. Sprinkler piping support having any of the following conditions:

2.1. Materials resting on or hung from sprinkler piping.

2.2. Damaged or loose hangers or braces.

3. Class II and Class III standpipe systems having any of the following conditions:

3.1. No hose or nozzle, where required.

3.2. Hose threads incompatible with fire department hose threads.

3.3. Hose connection cap missing.

3.4. Mildew, cuts, abrasions and deterioration evident.

3.5. Coupling damaged.

3.6. Gaskets missing or deteriorated.

3.7. Nozzle missing or obstructed.

4. Hose racks and cabinets having any of the following conditions:

4.1. Difficult to operate or damaged.

4.2. Hose improperly racked or rolled.

4.3. Inability of rack to swing 90 degrees (1.57 rad) out of the cabinet.

4.4. Cabinet locked, except as permitted by this code.

4.5. Cabinet door will not fully open.

4.6. Door glazing cracked or broken.

5. Portable fire extinguishers having any of the following conditions:

5.1. Broken seal or tamper indicator.

5.2. Expired maintenance tag.

5.3. Pressure gauge indicator in "red."

5.4. Signs of leakage or corrosion.

5.5. Mechanical damage, denting or abrasion of tank.

5.6. Presence of repairs such as welding, soldering or brazing.

5.7. Damaged threads.

5.8. Damaged hose assembly, couplings or swivel joints.

6. Fire alarm and detection control equipment, initiating devices and notification appliances having any of the following conditions:

6.1. Corroded or leaking batteries or terminals.

6.2. Smoke detectors having paint or other ornamentation that is not factory applied.

6.3. Mechanical damage to heat or smoke detectors.

6.4. Tripped fuses.

7. Fire department connections having any of the following conditions:

7.1. Fire department connections are not visible or able to be accessed from the fire apparatus access road.

7.2. Couplings or swivels are damaged.

7.3. Plugs and caps are missing or damaged.

7.4. Gaskets are deteriorated.

7.5. Check valve is leaking.

7.6. Identification signs are missing.

8. Fire pumps having any of the following conditions:

8.1. Pump room temperature is less than 40°F (4.4°C).

8.2. Ventilating louvers are not freely operable.

8.3. Corroded or leaking system piping.

8.4. Diesel fuel tank is less than two-thirds full.

8.5. Battery readings, lubrication oil or cooling water levels are abnormal.

SECTION I102
REFERENCED STANDARDS

I102.1 General. See Table I102.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

TABLE I102.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
NFPA 10—21	*Portable Fire Extinguishers*	I101.1
NFPA 25—20	*Inspection, Testing and Maintenance of Water-based Fire Protection Systems*	I101.1
NFPA 72—19	*National Fire Alarm and Signaling Code*	I101.1

APPENDIX J

BUILDING INFORMATION SIGN

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

User note:

About this appendix: *Appendix J provides design, installation and maintenance requirements for a Building Information Sign (BIS), a fire service tool to be utilized in the crucial, initial response of fire fighters to a structure fire. The BIS placard is designed to be utilized within the initial response time frame of an incident to assist fire fighters in their tactical sizing up of a situation as soon as possible after arrival on the scene of a fire emergency. The BIS design is in the shape of a fire service Maltese cross and includes five spaces (the four wings plus the centerpiece of the cross symbol) in which information is placed about the tactical considerations of construction type and hourly rating, fire protection systems, occupancy type, content hazards and special features that could affect tactical decisions and operations.*

APPENDIX K
CONSTRUCTION REQUIREMENTS FOR EXISTING AMBULATORY CARE FACILITIES

Deleted

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

User note:

About this appendix: *Appendix K was created with the intent to provide jurisdictions with an option for assessing minimum fire and life safety requirements for buildings containing ambulatory care facilities. While this appendix is written with the intent to apply retroactive minimum standards, it is recognized that the ambulatory care requirements are relatively recent additions to the* International Building Code®. *For that reason, these requirements are presented as an appendix so that the adopting authority can exercise judgment in the adoption and application of this section. This appendix would also be useful for those local and state jurisdictions that are specifically focused on ensuring the safety of existing ambulatory care facilities by providing minimum criteria that could be used to bring older facilities into compliance with the current standards at the discretion of the adopting jurisdiction. The technical requirements are based on the current* International Building Code *language, which is consistent with the overall concept of the current federal requirements.*

SECTION K101
GENERAL

K101.1 Scope. The provisions of this chapter shall apply to existing buildings containing ambulatory care facilities in addition to the requirements of Chapter 11. Where the provisions of this chapter conflict with either the construction requirements in Chapter 11 or the construction requirements that applied at the time of construction, the most restrictive provision shall apply.

K101.2 Intent. The intent of this appendix is to provide a minimum degree of fire and life safety to persons occupying existing buildings containing ambulatory care facilities where such buildings do not comply with the minimum requirements of the *International Building Code*.

SECTION K102
FIRE SAFETY REQUIREMENTS FOR EXISTING AMBULATORY CARE FACILITIES

K102.1 Separation. Ambulatory care facilities where the potential exists for four or more care recipients to be incapable of self-preservation at any time, whether rendered incapable by staff or staff has accepted responsibility for a care recipient already incapable, shall be separated from adjacent spaces, *corridors* or tenants with a *fire partition* installed in accordance with Section 708 of the *International Building Code*.

K102.2 Smoke compartments. Where the aggregate area of one or more ambulatory care facilities is greater than 10,000 square feet (929 m^2) on one story, the story shall be provided with a *smoke barrier* to subdivide the story into not fewer than two *smoke compartments*. The area of any one such *smoke compartment* shall be not greater than 22,500 square feet (2092 m^2). The travel distance from any point in a *smoke compartment* to a *smoke barrier* door shall be not greater than 200 feet (60 960 mm). The *smoke barrier* shall be installed in accordance with Section 709 of the *International Building Code* with the exception that *smoke barriers* shall be continuous from an outside wall to an outside wall, a floor to a floor, or from a *smoke barrier* to a *smoke barrier* or a combination thereof.

K102.2.1 Refuge area. Not less than 30 net square feet (2.8 m^2) for each nonambulatory care recipient shall be provided within the aggregate area of *corridors*, care recipient rooms, treatment rooms, lounge or dining areas and other low hazard areas within each *smoke compartment*. Each occupant of an ambulatory care facility shall be provided with access to a refuge area without passing through or utilizing adjacent tenant spaces.

K102.2.2 Smoke barriers. *Smoke barriers* shall be constructed in accordance with Sections 422 and 709 of the *International Building Code*.

Exceptions:

1. *Smoke barriers* shall be permitted to terminate at an atrium enclosure in accordance with Section 404.6 of the *International Building Code*.

2. *Smoke barriers* shall be continuous from an outside wall to an outside wall, a floor to a floor, a *smoke barrier* to a *smoke barrier* or a combination thereof.

K102.2.3 Opening protectives. Openings in *smoke barriers* shall be protected in accordance with Section 716 of the *International Building Code*. Opening protectives shall have a minimum *fire protection rating* of $^{1}/_{3}$ hour.

Exception: Existing wired glass vision panels in doors shall be permitted to remain.

K102.2.4 Penetrations. Penetrations of *smoke barriers* shall comply with the *International Building Code*.

Exception: *Approved* existing materials and methods of construction.

K102.2.5 Joints. Joints made in or between *smoke barriers* shall comply with the *International Building Code*.

Exception: *Approved* existing materials and methods of construction.

K102.2.6 Duct and air transfer openings. Penetrations in a *smoke barrier* by duct and air transfer openings shall comply with Section 717 of the *International Building Code*.

Exception: Where existing duct and air transfer openings in *smoke barriers* exist without smoke dampers, they shall be permitted to remain. Any changes to existing smoke dampers shall be submitted for review and *approved* in accordance with Section 717 of the *International Building Code*.

K102.2.7 Independent egress. A *means of egress* shall be provided from each *smoke compartment* created by *smoke barriers* without having to return through the *smoke compartment* from which *means of egress* originated.

K102.3 Automatic sprinkler system. An *automatic sprinkler system* shall be provided in ambulatory care facilities where required by Sections K102.3.1 and K102.3.2.

K102.3.1 Types IIB, IIIB and VB construction. An *automatic sprinkler system* shall be provided throughout the entire floor containing an ambulatory care facility in Types IIB, IIIB and VB construction where either of the following conditions exist at any time:

1. Four or more care recipients are rendered incapable of self-preservation.

2. One or more care recipients that are rendered incapable of self-preservation are located at other than the *level of exit discharge* serving such a facility.

In buildings where ambulatory care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* shall be installed throughout the entire floor where such care is provided, all floors below and all floors between the level of ambulatory care and the nearest *level of exit discharge*, including the *level of exit discharge*.

K102.3.2 High-rise buildings. In high-rise buildings containing ambulatory care facilities, an *automatic sprinkler system* shall be provided throughout the entire floor containing an ambulatory care facility where either of the following conditions exist at any time:

1. Four or more care recipients are rendered incapable of self-preservation.

2. One or more care recipients that are rendered incapable of self-preservation are located at other than the *level of exit discharge* serving such a facility.

In buildings where ambulatory care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* shall be installed throughout the entire floor where such care is provided, all floors below and all floors between the level of ambulatory care and the nearest *level of exit discharge*, including the *level of exit discharge*.

K102.4 Automatic fire alarm system. *Fire areas* containing ambulatory care facilities shall be provided with an electronically supervised automatic smoke detection system installed within the ambulatory care facility and in public use areas outside of tenant spaces, including *public corridors* and elevator lobbies.

Exception: Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, provided that the occupant notification appliances will activate throughout the notification zones upon sprinkler waterflow.

K102.5 Waste and linen chutes. In ambulatory care facilities, existing waste and linen chutes shall comply with Sections K102.5.1 through K102.5.5.

K102.5.1 Enclosures. Chutes shall be enclosed with 1-hour *fire-resistance-rated* construction. Opening protectives shall be in accordance with Section 716 of the *International Building Code* and have a *fire protection rating* of not less than 1 hour.

K102.5.2 Chute intakes. Chute intakes shall comply with Section K102.5.2.1 or K102.5.2.2.

K102.5.2.1 Chute intake direct from corridor. Where intake to chutes is direct from a *corridor*, the intake opening shall be equipped with a chute intake door in accordance with Section 716 of the *International Building Code* and have a *fire protection rating* of not less than 1 hour.

K102.5.2.2 Chute intake via a chute intake room. Where the intake to chutes is accessed through a chute intake room, the room shall be enclosed with 1-hour *fire-resistance-rated* construction. Opening protectives for the intake room shall be in accordance with Section 716 of the *International Building Code* and have a *fire protection rating* of not less than $^{3}/_{4}$ hour. Opening protectives for the chute enclosure shall be in accordance with Section K102.5.1.

K102.5.3 Automatic sprinkler system. Chutes shall be equipped with an *approved automatic sprinkler system* in accordance with Section 903.2.11.2.

K102.5.4 Chute discharge rooms. Chutes shall terminate in a dedicated chute discharge room. Such rooms shall be separated from the remainder of the building by not less than 1-hour *fire-resistance-rated* construction. Opening protectives shall be in accordance with Section 716 of the *International Building Code* and have a *fire protection rating* of not less than 1 hour.

K102.5.5 Chute discharge protection. Chute discharges shall be equipped with a self-closing or automatic-closing opening protective in accordance with Section 716 of the *International Building Code* and have a *fire protection rating* of not less than 1 hour.

SECTION K103
INCIDENTAL USES IN EXISTING AMBULATORY CARE FACILITIES

K103.1 General. Incidental uses associated with and located within existing ambulatory care facilities required to be separated by Section 422 of the *International Building Code*, and that generally pose a greater level of risk to such occupancies, shall comply with the provisions of Sections K103.2 through K103.4.2.1. Incidental uses in ambulatory care facilities required to be separated by Section 422 of the *International Building Code* are limited to those listed in Table K103.1.

TABLE K103.1
INCIDENTAL USES IN EXISTING AMBULATORY CARE FACILITIES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen fuel gas rooms, not classified as Group H	1 hour
Incinerator rooms	2 hours and provide automatic sprinkler system
Laboratories not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
Waste and linen collection rooms with containers with total volume of 10 cubic feet or greater	1 hour or provide automatic sprinkler system
Storage rooms greater than 100 square feet	1 hour or provide automatic sprinkler system

Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons for flooded lead-acid, nickel cadmium or VRLA, or more than 1,000 pounds for lithium-ion and lithium metal polymer used for facility standby power, emergency power or uninterruptible power supplies	1 hour

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L.

K103.2 Occupancy classification. Incidental uses shall not be individually classified in accordance with Section 302.1 of the *International Building Code*. Incidental uses shall be included in the building occupancies in which they are located.

K103.3 Area limitations. Incidental uses shall not occupy more than 10 percent of the *building area* of the story in which they are located.

K103.4 Separation and protection. The incidental uses listed in Table K103.1 shall be separated from the remainder of the building or be equipped with an *automatic sprinkler system*, or both, in accordance with the provisions of that table.

K103.4.1 Separation. Where Table K103.1 specifies a *fire resistance rated* separation, the incidental uses shall be separated from the remainder of the building in accordance with Section 509.4.1 of the *International Building Code*.

K103.4.2 Protection. Where Table K103.1 permits an *automatic sprinkler system* without a *fire-resistance-rated* separation, the incidental uses shall be separated from the remainder of the building by construction capable of resisting the passage of smoke in accordance with Section 509.4.2 of the *International Building Code*.

K103.4.2.1 Protection limitation. Except as otherwise specified in Table K103.1 for certain incidental uses, where an *automatic sprinkler system* is provided in accordance with Table K103.1, only the space occupied by the incidental use need be equipped with such a system.

SECTION K104
MEANS OF EGRESS REQUIREMENTS FOR EXISTING AMBULATORY CARE FACILITIES

K104.1 Size of doors. The required capacity of each door opening shall be sufficient for the *occupant load* thereof and shall provide a minimum clear opening width of 28 inches (711 mm). Where this section requires a minimum clear opening width of 28 inches (711 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a minimum clear opening width of 28 inches (711 mm). In ambulatory care facilities, doors serving as *means of egress* from patient treatment rooms shall provide a minimum clear opening width of 32 inches (813 mm). The maximum width of a swinging door leaf shall be 48 inches (1219 mm) nominal. The minimum clear opening height of doors shall be 80 inches (2032 mm).

Exceptions:

1. Door openings to storage closets less than 10 square feet (0.93 m^2) in area shall not be limited by the minimum clear opening width.
2. The width of door leaves in revolving doors that comply with Section 1010.3.1 shall not be limited.
3. The maximum width of door leaves in revolving doors that comply with Section 1010.3.2 shall not be limited.
4. *Exit access* doors serving a room not larger than 70 square feet (6.5 m^2) shall have a door leaf width of not less than 24 inches (610 mm).
5. Door closers and door stops shall be permitted to be 78 inches (1981 mm) minimum above the floor.

K104.2 Corridor and aisle width. *Corridor* width shall be as determined in Section 1005.1 and this section. The minimum width of *corridors* and *aisles* that serve gurney traffic in areas where patients receive care that causes them to be incapable of self-preservation shall be not less than 72 inches (1829 mm).

K104.3 Existing elevators. Existing elevators, escalators, dumbwaiters and moving walks shall comply with the requirements of Sections K104.3.1 and K104.3.2.

K104.3.1 Elevators, escalators, dumbwaiters and moving walks. Existing elevators, escalators, dumbwaiters and moving walks in ambulatory care facilities required to be separated by Section 422 of the *International Building Code* shall comply with ASME A17.3.

K104.3.2 Elevator emergency operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more above or below the main floor or other level of a building and intended to serve the needs of emergency personnel for fire fighting or rescue purposes shall be provided with emergency operation in accordance with ASME A17.3.

SECTION K105
REFERENCED STANDARDS

K105.1 General. See Table K105.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

TABLE K105.1
REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
IBC—21	*International Building Code*	K101.2, K102.1, K102.2, K102.2.2, K102.2.3, K102.2.4, K102.2.5, K102.2.6, K102.5.1, K102.5.2.1, K102.5.2.2, K102.5.4, K102.5.5, K103.1, K103.2, K103.4.1, K103.4.2, K104.3.1
ASME A17.3—2020	*Safety Code for Existing Elevators and Escalators*	K104.3.1, K104.3.2

APPENDIX L
REQUIREMENTS FOR FIRE FIGHTER AIR REPLENISHMENT SYSTEMS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

User note:

About this appendix: *Appendix L provides for the design, installation and maintenance of permanently installed fire fighter breathing air systems in buildings designated by the jurisdiction. Breathing air is critical for fire-fighting operations. Historically, fire departments have supplied air bottles by means of a "bottle brigade," whereby fire fighters manually transport air bottles up stairways, which is an extraordinarily fire fighter-intensive process and takes fire fighters away from their primary mission of rescue and fire fighting. Technology now exists to address the issue using in-building air supply systems. Fire fighter breathing air systems were introduced in the late 1980s and are now required in a number of communities throughout the United States. The system has been called a "standpipe for air" and consists of stainless steel, high-pressure piping that is supplied by on-site air storage or fire department air supply units. Air-filling stations are then strategically located throughout the building, allowing fire fighters to refill breathing air cylinders inside the fire building, negating the required "bottle brigade," and making more fire fighters available for search, rescue and fire suppression operations.*

APPENDIX M
HIGH-RISE BUILDINGS—RETROACTIVE AUTOMATIC SPRINKLER REQUIREMENT

Deleted

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

User note:

About this appendix: *Appendix M was created with the intent to provide an option for adoption by jurisdictions that choose to require existing high-rise buildings to be retrofitted with automatic sprinklers. Modern fire and building codes require complete automatic fire sprinkler protection and a variety of other safety features in new high-rise construction. Many older high-rise buildings lack automatic sprinkler protection and other basic fire protection features necessary to protect the occupants, emergency responders and the structure itself. Without complete automatic sprinkler protection, fire departments cannot provide the level of protection that high-rise buildings demand. Existing high-rise buildings that are not protected with automatic sprinklers represent a significant hazard to occupants and fire fighters, and can significantly impact a community's infrastructure and economic viability in the event of a fire loss.*

SECTION M101
SCOPE

M101.1 Scope. An *automatic sprinkler system* shall be installed in all existing high-rise buildings in accordance with the requirements and compliance schedule of this appendix.

SECTION M102
WHERE REQUIRED

M102.1 High-rise buildings. An *automatic sprinkler system* installed in accordance with Section 903.3.1.1 shall be provided throughout existing high-rise buildings.

Exceptions:

1. Airport traffic control towers.
2. Open parking structures.
3. Group U occupancies.
4. Occupancies in Group F-2.

SECTION M103
COMPLIANCE

M103.1 Compliance schedule. Building owners shall file a compliance schedule with the *fire code official* not later than 365 days after receipt of a written notice of violation. The compliance schedule shall not exceed 12 years for an *automatic sprinkler system* retrofit.

APPENDIX N

INDOOR TRADE SHOWS AND EXHIBITIONS

The provisions contained in this appendix are adopted as part of this code in Section 325.

~~*The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.*~~

User note:

~~***About this appendix:*** *Appendix N was created to address the hazards that are associated with larger, more complex trade shows and exhibitions. Although many of these requirements are already included in various locations in this code, some of the more important items, such as requirements for covered booths and multiple-level booths, are not. The intent is to have the requirements covering these events in a single location with pointers to other locations within this code, which makes it easier for those organizing exhibitions and individual exhibitors who are unfamiliar with the fire code to locate the requirements that are applicable to them.~~