

floor or seating areas. The support system shall be capable of maintaining other membranes not less than 7 feet (2134 mm) above the floor, seating area or surface of the water.

- ❖ To allow safe occupant egress and access for fire fighting, air-supported and air-inflated structures that have an occupant load of more than 50 or cover a swimming pool are required to have a standby support system. Regardless of the occupant load, swimming pools are included because of the additional time necessary to egress when in a pool and because of the hazard that would exist if a membrane collapsed on a pool in which a person was swimming.

The support system is to be capable of maintaining all membrane structures at least 7 feet (2134 mm) above the floor, seating area or surface water, whichever is highest, to permit upright egress travel by the occupants, as well as to aid occupants who may be unable to egress. Where the membrane structure is used as a roof on a Type I or II building, the support system must be capable of maintaining the membrane structure at least 20 feet (6096 mm) above the floor or seating area so that the risk of contribution of the roof structure to a fire is minimized.

SECTION 3103 TEMPORARY STRUCTURES

3103.1 General. The provisions of Sections 3103.1 through 3103.4 shall apply to structures erected for a period of less than 180 days. Tents, umbrella structures and other membrane structures erected for a period of less than 180 days shall comply with the *International Fire Code*. Those erected for a longer period of time shall comply with applicable sections of this code.

- ❖ The purpose of Section 3103 is to provide public safety requirements in relation to fire, storm, collapse and crowd behavior in temporary structures. "Temporary use" is defined as a period of less than 180 days. Section 1029 of the code and ICC 300 are applicable to the means of egress and the use of bleachers, grandstands and folding or telescopic seating within the temporary structure. Temporary structures may also include temporary wiring and other fire hazards, which are different from those expected in permanent structures. These items are to be identified in the construction documents.

Any structure that is erected for a period of 180 days or more must comply with other sections of the code applicable to permanent structures. It should be noted that "temporary" refers to the structure being erected, not the use of the structure; therefore, if a structure is erected for 365 days a year, but is used on a seasonal basis for less than 180 days, this section does not apply. Such structures are considered permanent. It should also be noted that membrane structures, even those erected for less than 180 days, are subject to standards applicable to permanent buildings where they are attached to such buildings (see Section 3102.1).

A temporary structure can be placed on a permanent foundation without being considered as a permanent structure.

Section 107 addresses permitting of such structures. In particular it does give some leeway to the building official to allow extensions of the 180-day criteria.

3103.1.1 Conformance. Temporary structures and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure public health, safety and general welfare.

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

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

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

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

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

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

If temporary structures are permitted in flood hazard areas established by Section 1612, a certain level of conformance is appropriate in order to minimize the likelihood of increasing flood heights or flood damage. Communities that participate in the NFIP must take the following measures into consideration:

1. Anchoring should be required to prevent flotation and movement during conditions of base flood.
2. In A Zones, walled and roofed structures on floors below the elevation required by Section 1612 should have flood openings to minimize hydrostatic loads (see ASCE 24).
3. Portions of structures that are below the elevation required by Section 1612 must be constructed of flood damage-resistant materials.
4. If the structures have utility service or communication equipment, those elements should be elevated above the DFE.
5. Placement in floodways and flood hazard areas subject to high-velocity wave action (V Zone) should be avoided.

3103.1.2 Permit required. Temporary structures that cover an area greater than 120 square feet (11.16 m²), including connecting areas or spaces with a common *means of egress* or entrance that are used or intended to be used for the gathering together of 10 or more persons, shall not be erected, operated or maintained for any purpose without obtaining a *permit* from the *building official*.

❖ Permits are required for temporary structures that are greater than 120 square feet (11 m²) and are used for the gathering of 10 or more people. This provides notice to the building department for larger temporary structures that pose a higher fire and life safety risk related to their size and presence of occupants, as well as relief to smaller temporary structures that pose a low risk.

3103.2 Construction documents. A *permit* application and *construction documents* shall be submitted for each installation of a temporary structure. The *construction documents* shall include a *site plan* indicating the location of the temporary structure and information delineating the *means of egress* and the *occupant load*.

❖ Before the installation of any temporary structure, a permit application and construction documents are required to be submitted.

Construction documents, as defined in Chapter 2, include written, graphic and pictorial documents. At minimum, these documents are to clearly provide pertinent information about the project, including the location, seating capacity, construction and all mechanical and electrical equipment. The code references *means of egress* and *occupant load* as items of particular interest for temporary structures because such structures are commonly tents used for special gatherings such as weddings or parties, and therefore the *occupant load* and *clear path of egress* are of particular concern. However, it should be noted that these provisions are not intended to remove the need for submittals that are necessary for all new construction, including structural details, calculations, soil tests and any other construction documents that are pertinent. These documents would need to be signed and sealed by a registered design professional as required for new construction.

3103.3 Location. Temporary structures shall be located in accordance with the requirements of Table 602 based on the *fire-resistance rating* of the *exterior walls* for the proposed type of construction.

❖ With respect to exposure hazards, temporary structures are no different from permanent structures. Therefore, the *fire-resistance rating* of the temporary structure's exterior walls will depend on the *occupancy* and the *fire separation distance*.

3103.4 Means of egress. Temporary structures shall conform to the *means of egress* requirements of Chapter 10 and shall

have an *exit access* travel distance of 100 feet (30 480 mm) or less.

❖ The means of egress in temporary structures is to comply with the requirements of Chapter 10, except the maximum exit access travel distance is limited to 100 feet (30 480 mm). The reduced travel distance applies to all temporary uses and is based on concerns associated with the nature of temporary structure construction, which may accelerate fire spread or rapidly decrease the stability of the structure during a fire.

SECTION 3104 PEDESTRIAN WALKWAYS AND TUNNELS

3104.1 General. This section shall apply to connections between buildings such as *pedestrian walkways* or *tunnels*, located at, above or below grade level, that are used as a means of travel by persons. The *pedestrian walkway* shall not contribute to the *building area* or the number of *stories* or height of connected buildings.

❖ Pedestrian walkways are normally seen as bridges connecting adjacent buildings (see Commentary Figure 3104.1). This section addresses the practical application of pedestrian walkways and tunnels, including walkways between buildings, grade-level connections between buildings and corridors around the perimeter of one building. The area of the walkway itself is not to be considered a part of any building it serves, nor is it considered to add to the number of stories or height of any building it serves, provided that the walkway and its construction comply with this section. In order to not be considered part of the building or require that buildings be evaluated as a single building, Sections 3104.2 through 3104.10 provide specific design conditions and options that are required to be met. Note that while this section implies through its use of the singular terms "walkway" and "tunnel" that walkways and tunnels cannot connect more than one story, this section does not



Commentary Figure 3104.1
EXAMPLE—PEDESTRIAN WALKWAY

SECTION 3107 of the 2018 International Fire Code

OPERATIONAL REQUIREMENTS

3107.1 General.

Temporary and permanent tents and membrane structures shall comply with this section.

3107.2 Combustible materials.

Hay, straw, shavings or similar combustible materials shall not be located within any tent or membrane structure containing an assembly occupancy, except the materials necessary for the daily feeding and care of animals. Sawdust and shavings utilized for a public performance or exhibit shall not be prohibited provided that the sawdust and shavings are kept damp. Combustible materials shall not be permitted under stands or seats at any time. *This would include wrapping paper, newspaper and paper decorations.*

3107.3 Smoking.

Smoking shall not be permitted in tents or membrane structures. Approved "No Smoking" signs shall be conspicuously posted in accordance with Section 310.

3107.4 Open or exposed flame.

Open flame or other devices emitting flame, fire or heat or any flammable or combustible liquids, gas, charcoal or other cooking device or any other unapproved devices shall not be permitted inside or located within 20 feet (6096 mm) of the tent or membrane structures while open to the public unless approved by the fire code official.

3107.5 Fireworks.

Fireworks shall not be used within 100 feet (30 480 mm) of tents or membrane structures.

3107.6 Spot lighting.

Spot or effect lighting shall only be by electricity, and all combustible construction located within 6 feet (1829 mm) of such equipment shall be protected with approved noncombustible insulation not less than 91/4 inches (235 mm) thick.

3107.7 Safety film.

Motion pictures shall not be displayed in tents or membrane structures unless the motion picture film is safety film.

3107.8 Clearance.

There shall be a clearance of not less than 3 feet (914 mm) between the fabric envelope and all contents located inside membrane structures.

3107.9 Portable fire extinguishers.

Approved portable fire extinguishers complying with Section 906 shall be provided and placed in locations as required by the fire code official.

3107.10 Fire protection equipment.

Fire hose lines, water supplies and other auxiliary fire equipment shall be maintained at the site in such numbers and sizes as required by the fire code official.

3107.11 Occupant load factors.

The occupant load allowed in an assembly structure, or portion thereof, shall be determined in accordance with Chapter 10.

3107.12 Heating and cooking equipment.

Heating and cooking equipment shall be in accordance with Sections 3107.12.1 through 3107.12.7.

3107.12.1 Installation.

Heating or cooking equipment, tanks, piping, hoses, fittings, valves, tubing and other related components shall be installed as specified in the International Mechanical Code and the International Fuel Gas Code, and shall be approved by the fire code official.

3107.12.2 Venting.

Gas, liquid and solid fuel-burning equipment designed to be vented shall be vented to the outside air as specified in the International Fuel Gas Code and the International Mechanical Code. Such vents shall be equipped with approved spark arresters where required. Where vents or flues are used, all portions of the tent or membrane structure shall be not less than 12 inches (305 mm) from the flue or vent.

3107.12.3 Location.

Cooking and heating equipment shall not be located within 10 feet (3048 mm) of exits or combustible materials.

3107.12.4 Operations.

Operations such as warming of foods, cooking demonstrations and similar operations that use solid flammables, butane or other similar devices that do not pose an ignition hazard, shall be approved.

3107.12.5 Cooking tents.

Tents with sidewalls or drops where cooking is performed shall be separated from other tents or membrane structures by not less than 20 feet (6096 mm).

3107.12.6 Outdoor cooking.

Outdoor cooking that produces sparks or grease-laden vapors shall not be performed within 20 feet (6096 mm) of a tent or membrane structure.

3107.12.7 Electrical heating and cooking equipment.

Electrical cooking and heating equipment shall comply with NFPA 70.

3107.13 LP-gas.

The storage, handling and use of LP-gas and LP-gas equipment shall be in accordance with Sections 3107.13.1 through 3107.13.3.

3107.13.1 General.

LP-gas equipment such as containers, tanks, piping, hoses, fittings, valves, tubing and other related components shall be approved and in accordance with Chapter 61 and with the International Fuel Gas Code.

3107.13.2 Location of containers.

LP-gas containers and tanks shall be located outside in accordance with Table 6104.3. Pressure relief devices shall be pointed away from the tent or membrane structure.

3107.13.3 Protection and security.

Portable LP-gas containers, tanks, piping, valves and fittings that are located outside and are being used to fuel equipment inside a tent or membrane structure shall be adequately protected to prevent tampering, damage by vehicles or other hazards and shall be located in an approved location. Portable LP-gas containers shall be secured to prevent unauthorized movement.

3107.14 Flammable and combustible liquids.

The storage of flammable and combustible liquids and the use of flammable-liquid-fueled equipment shall be in accordance with Sections 3107.14.1 through 3107.14.3.

3107.14.1 Use.

Flammable-liquid-fueled equipment shall not be used in tents or membrane structures.

3107.14.2 Flammable and combustible liquid storage.

Flammable and combustible liquids shall be stored outside in an approved manner not less than 50 feet (15 240 mm) from tents or membrane structures. Storage shall be in accordance with Chapter 57.

3107.14.3 Refueling.

Refueling shall be performed in an approved location not less than 20 feet (6096 mm) from tents or membrane structures.

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.

Batteries shall be disconnected in an appropriate manner.

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.

3107.15.2.2 Inspection.

Fuel systems shall be inspected for leaks.

3107.15.2.3 Closure.

Fuel tank openings shall be locked and sealed to prevent the escape of vapors.

3107.15.3 Location.

The location of vehicles or equipment shall not obstruct means of egress.

3107.15.4 Places of assembly.

When a compressed natural gas (CNG) or liquefied petroleum gas (LP-gas) powered vehicle is parked inside a place of assembly, all the following conditions shall be met:

1. The quarter-turn shutoff valve or other shutoff valve on the outlet of the CNG or LP-gas container shall be closed and the engine shall be operated until it stops. Valves shall remain closed while the vehicle is indoors.
2. The hot lead of the battery shall be disconnected.
3. Dual-fuel vehicles equipped to operate on gasoline and CNG or LP-gas shall comply with this section and Sections 3107.15.1 through 3107.15.3 for gasoline-powered vehicles.

3107.15.5 Competitions and demonstrations.

Liquid and gas-fueled vehicles and equipment used for competition or demonstration within a tent or membrane structure shall comply with Sections 3107.15.5.1 through 3107.15.5.3.

3107.15.5.1 Fuel storage.

Fuel for vehicles or equipment shall be stored in approved containers in an approved location outside of the structure in accordance with Section 3107.14.2.

3107.15.5.2 Fueling.

Refueling shall be performed outside of the structure in accordance with Section 3107.14.3.

3107.15.5.3 Spills.

Fuel spills shall be cleaned up immediately.

3107.16 Separation of generators.

Generators and other internal combustion power sources shall be separated from tents or membrane structures by not less than 20 feet (6096 mm) and shall be isolated from contact with the public by fencing, enclosure or other approved means.

3107.17 Standby personnel.

Where, in the opinion of the fire code official, it is essential for public safety in a tent or membrane structure used as a place of assembly or any other use where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest or activity, the owner, agent or lessee shall employ one or more qualified persons, as required and approved, to remain on duty during the times such places are open to the public, or when such activity is being conducted.

3107.17.1 Duties.

Before each performance or the start of such activity, standby personnel shall keep diligent watch for fires during the time such place is open to the public or such activity is being conducted and take prompt measures for extinguishment of fires that occur and assist in the evacuation of the public from the structure.

3107.17.2 Crowd managers.

There shall be trained crowd managers or trained crowd supervisors at a ratio of one crowd manager or supervisor for every 250 occupants, as approved.

3107.18 Combustible vegetation.

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.

3107.19 Combustible waste material.

The floor surface inside tents or membrane structures and the grounds outside and within a 30-foot (9144 mm) perimeter shall be kept free of combustible waste and other combustible materials that could create a fire hazard. Such waste shall be stored in approved containers and removed from the premises not less than once a day during the period the structure is occupied by the public.

