



FIRE PREVENTION REGULATIONS TENT INSTALLATION AND INSPECTIONS

CITY OF LACONIA FIRE PREVENTION DIVISION
848 NORTH MAIN STREET, LACONIA, NH 03246
Call (603) 524-6881 for appointments and information

FIRE
PREVENTION
Special Events

700-2

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PURPOSE:

The purpose of this bulletin is to provide guidance for fire and building inspectors as they inspect tents for compliance with the NH State Fire Code and the NH State Building Code. Traditionally, informational bulletins issued by the State Fire Marshal's Office are limited to applications of the fire code. Tents represent a unique situation where it may be difficult to separate the requirements of the fire and building codes from each other. Inspectors should remember that some tent installers may travel from outside of New England and may reference the requirements of the International Fire Code (IFC) (1).

HISTORY:

The requirement for the inspection of tents, or some of their components, is first found in RSA 155:20 adopted in June of 1953, which required a certificate of flame-proofing for tents and canvas structures, a statute that continues to be in effect today. The NH State Fire Code was adopted in 1972 which introduced the requirements of NFPA 101(101) (2). In 2002, the International Building Code (IBC) (3) was adopted as part of the NH State Building Code, bringing with it certain structural requirements for tents.

GENERAL GUIDELINES:

FIRE RESISTANCE:

In addition to RSA 155:20, NFPA 101 (11.11.2.1) requires a certificate of flame-proofing. This section allows the fabric to meet the applicable requirements of NFPA 701, method 2 or NFPA 102 (4)(A) (102) (11.11.2.1) allows the AHJ to accept the certificate "by an organization acceptable to the authority having jurisdiction." One such label may be that of the California State Fire Marshal. The IFC (3104.4) requires that an affidavit certifying the flame-proofing be submitted as well as a label affixed to the fabric.

OCCUPANCY/USE GROUP CLASSIFICATION:

The IBC (3103.1), NFPA101 (11.11.1.2) and 102 (8.1.2) classify tents as temporary structures and are permitted for no more than 180 days. The use group and occupancy classification of the tent must be determined. Many tents will be classified as a place of assembly, while others may be classified as mercantile, storage or business. Tents should be inspected according to the requirements for the appropriate occupancy. Tents classified as assembly occupancies with an occupancy load over 50 persons must have a Place of Assembly Permit that will necessitate emergency plans (including weather monitoring), seating plans, emergency lighting, crowd managers and all of the requirements of NFPA 101 Chapter 12 that are applicable (B).

STRUCTURAL/CONSTRUCTION DOCUMENTS:

The IBC (3103.2) and NFPA 102 (8.2) require that structural/construction documents be submitted for each installation of a tent 400 sq.ft. and larger. The IBC also requires a permit be issued for the erection of the tent (c). The IBC calls the documents *Construction Documents*; NFPA102 calls the documents *Structural Design Load Requirements*. They both require essentially the same thing. Structural documents should include site location, seating or furniture layout, design wind load, anchoring diagram, and allowable snow loading if used in the winter. A properly designed layout will include the required tensile strength of the straps or ropes and the pull out resistance of the stakes. NFPA 102 requires that there be a minimum of 10 feet between stake lines of adjacent tents with some exceptions. It should be noted that many tents may not have wind loading documentation. In lieu of wind loading documentation, a very conservative emergency plan may be used. For example, the emergency plan would include someone monitoring the weather and wind. If the wind meets or exceeds 20 mph the tent would be evacuated. The installer should be able to provide guidance for evacuation and the maximum allowable wind speed.

ANCHORING: (D)

There are two common methods for anchoring a tent, with stakes and/or ballast. Tents that were designed with wind loads, conforming to standards such as ASCE 7, will have documentation that can be used to develop an anchorage plan using stakes and/or ballast. Tent manufacturers often supply documentation of loads with the structural documentation. Installers/owners should supply an anchorage plan for these tents demonstrating sufficient staking and/or ballasting with permit application (E)

The majority of tents, commonly referred to as pole or frame tents, will not have any load documentation. For those tents the general guidance below should be used with a conservative emergency plan as outlined in Structural/Construction Documents above. For tents without load documentation the code official should consider whether to allow their use when occupancies increase beyond an occupant load of 300 people.

General guidance for inspecting stakes in the absence of engineered diagram is as follows:

The minimum stake length will most usually be 36" and the minimum diameter is 1"

Stakes should be driven straight down and into the ground with only 2"-4" exposed.

Webbing or ropes should be tied to the stake at ground level. In no case should the tie off be any higher than 2"-4" inches off the ground.

The optimum angle of a guy rope or straps is 45 degrees from the eave of the tent or top of the 37 degrees at the eave unless engineering documents state otherwise. If engineering documents are not available a rule of thumb for staking is 10 lbs./ sq. ft. distributed equally at each anchoring point. The installer should provide evidence of this loading.

Ballasting provides a different dynamic. Typical ballast can be concrete, steel or water filled barrels. Caution should be used when evaluating ballasts. The holding ability of the ballast is not a pound for pound equivalent. Eight hundred (800) pounds of ballast may not provide eight hundred (800) pounds of uplift resistance.

Ballast may be placed on a plate to which a guy line is attached or the guy line may be attached directly to the ballast. Consequently, engineering documents are instrumental in a ballasting situation.

FIRE PROTECTION:

Smoking shall not be permitted in any tent. Fire extinguishers must be placed in accordance with NFPA 10.

REFERENCES:

1. International Fire Code, 2018 edition (F)
2. NFPA 101, Life Safety Code, 2015 edition
3. International Building Code, 2009, 2015 editions (G)
4. NFPA 102, Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures. 2016 edition

NOTES:

A. NFPA 102 is adopted by reference through NFPA 1.

B. In certain cases, one or more applicable codes may require a sprinkler system or fire alarm system in assembly uses. This would apply to tents in this use group. Inspectors and installers should be ready to provide alternative forms of protection for tents due to the technical infeasibility of attaching sprinkler piping to tent frames.

C. The IBC requires a building permit be issued for any tent over 120 sq. ft. New Hampshire has amended the 120 sq. ft. to 400 sq. ft. and over.

D. Information provided by the Industrial Fabric Association International, Tent Rental Division, Stake and Ballast Studies and Procedural Handbook for Tentage.

E. The Industrial fabrics Association International-Tent Rental Division has conducted studies for both staking and ballasting that can be used for anchorage plans for tents with or without load documentation.

F. The International Fire Code has not been adopted by the State of New Hampshire. Information provided is for informational purposes only

G. The requirements in the IBC 2009 and 2018 editions are the same with the exception of the following new requirement in the 2015 edition "3103.1 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."

