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TEMPORARY AIR-INFLATED STRUCTURES INSTALLATION REQUIREMENTS

2012 FIRE CODE DEFINITIONS

- **AIR-INFLATED STRUCTURE.** A structure that uses air-pressurized membrane beams, arches or other elements to enclose space. Occupants of such a structure do not occupy the pressurized areas used to support the structure.
- **AIR-SUPPORTED STRUCTURE.** A structure wherein the shape of the structure is attained by air pressure and occupants of the structure are within the elevated pressure area. Air supported structures are of two basic types:
 - **Double skin.** Similar to a single skin, but with an attached liner that is separated from the outer skin and provides an airspace which serves for insulation, acoustic, aesthetic or similar purposes.
 - **Single skin.** Where there is only the single outer skin and the air pressure is directly against that skin.

Construction documents - Inspections

The **Vendor** shall provide a detailed site plan for all air-supported structures to be provided with each TUP application for approval. The site shall indicate the location, type of electrical equipment, and documentation of structural stability shall be provided. Vendors may wish to meet and discuss the event with a Fire Inspector in order to avoid an un-necessary delay on opening day.

All structures shall be inspected following setup and prior to public use. To schedule an inspection please call 623-222-5100.

The inspection will ensure tie-downs and anchors are adequate and properly located, structural fabric and tie-down material is in acceptable condition, and that the structure has been stabilized.

3103.9 Anchorage.

Tents and membrane structures and their appurtenances shall be adequately roped, braced and anchored to withstand the elements of weather and prevent against collapsing. Documentation of structural stability shall be furnished to the *fire code official* on request.

3103.10 Temporary air-supported and air-inflated membrane structures.

Temporary air-supported and air-inflated membrane structures shall be in accordance with Sections 3103.10.1 through 3103.10.4.

3103.10.2 Fabric envelope design and construction.

Air-supported and air-inflated structures shall have the design and construction of the fabric envelope and the method of anchoring in accordance with Architectural Fabric Structures Institute ASI 77.

3103.10.1 Door operation.

During high winds exceeding 50 miles per hour (22 m/s) the use of doors in air-supported structures shall be controlled to avoid excessive air loss. Doors shall not be left open.

3103.10.3 Blowers.

An air-supported structure used as a place of assembly shall be furnished with not less than two blowers, each of which has adequate capacity to maintain full inflation pressure with normal leakage. The design of the blower shall be so as to provide integral limiting pressure at the design pressure specified by the manufacturer.

3103.10.4 Auxiliary power.

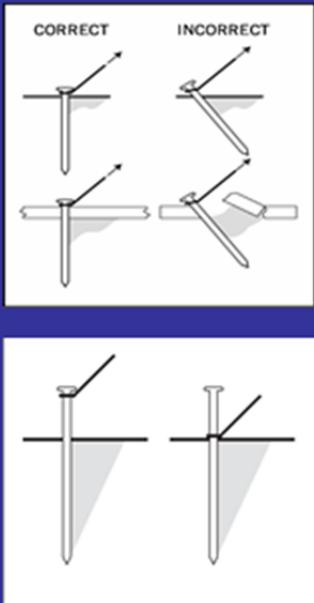
Places of public assembly for more than 200 persons shall be furnished with either a fully automatic auxiliary engine-generator set capable of powering one blower continuously for 4 hours, or a supplementary blower powered by an internal combustion engine which shall be automatic in operation.

Information contained herein is based upon the staking study conducted by Industrial Fabrics Association International – Tent Rental Division (IFAI-TRD)
Correct and Incorrect Stake Placement

Example #1

Proper Staking

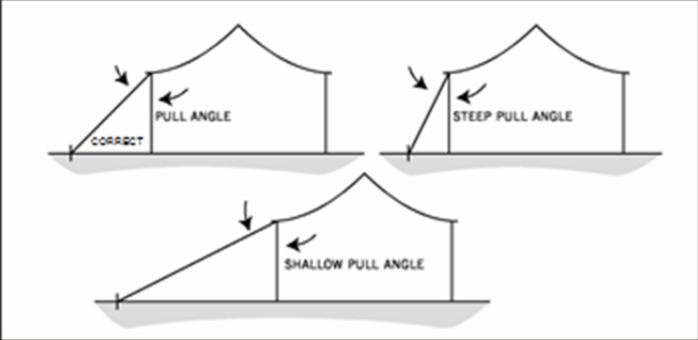
- The Right angle: when a stake is installed at an angle of greater than 15° from vertical the soil wedge is reduced. This in turn reduces the holding ability of the stake even when the anchoring line is properly attached at ground level.
- When the stake is not installed entirely into the ground and the anchoring line is attached well above ground level; the reduced soil wedge and ground acting as a fulcrum further reduces the holding strength.



Example #2

Proper Staking (Anchoring)

- Stakes for pole and frame tents should be located at between 35-40° angle from the tent. A good rule of thumb for the installer is the stake should be located no closer than one foot (1ft) less than the height of the side of the tent and no greater than the height of the side.
- Example: An 8' side the minimum height is 7' and a 7' side the minimum is 6'. Extending the stake location further from the tent increases the play (slope) in a line causing slack which will increase loss of tension and decreases down pressure on the side which, for pole tents could cause the side pole to kick out especially when the tent is installed with sides or a frame to lift.



3104.1 General.

All tents and membrane structures, both temporary and permanent, shall be in accordance with this section. Permanent tents and membrane structures shall also comply with the International Building Code.

3104.2 Flame propagation performance treatment.

Before a permit is granted, the owner or agent shall file with the fire code official a certificate executed by an approved testing laboratory certifying that the tents and membrane structures and their appurtenances; sidewalls, drops and tarpaulins; floor coverings, bunting and combustible decorative materials and effects, including sawdust when used on floors or passageways, are composed of material meeting the flame propagation performance criteria of NFPA 701 or shall be treated with a flame retardant in an approved manner and meet the flame propagation performance criteria of NFPA 701, and that such flame propagation performance criteria are effective for the period specified by the permit.

3104.3 Label.

Membrane structures or tents shall have a permanently affixed label bearing the identification of size and fabric or material type.

3104.4 Certification.

An affidavit or affirmation shall be submitted to the fire code official and a copy retained on the premises on which the tent or air-supported structure is located. The affidavit shall attest to the following information relative to the flame propagation performance criteria of the fabric:

1. Names and address of the owners of the tent or air-supported structure.
2. Date the fabric was last treated with flame-retardant solution.
3. Trade name or kind of chemical used in treatment.
4. Name of person or firm treating the material.
5. Name of testing agency and test standard by which the fabric was tested.

3104.5 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 the sawdust and shavings are kept damp. Combustible materials shall not be permitted under stands or seats at any time.

3104.6 Smoking.

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

3104.7 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.