



## Tent Anchoring Requirements

### Staking/Anchoring:

- The ability of the tent to withstand wind loading and other weather related events is paramount to the safety of all individuals utilizing the tent space and to protect adjacent property. In the absence of engineered specifications and manufacturer's installation instructions, the following information will serve as a guideline for the tent anchoring requirements. These anchoring requirements have been thoroughly tested by the Tent Division of International Fabrics Association International (IFAI).
- Install all tents in accordance with the manufacturer's instructions. (Preferred method)
- Use the staking /anchoring charts provided by the tent manufacturer. (Preferred method)
- Provide the location of stakes and/or ballasts for anchoring on the site plan. Also provide the distance of the stakes and/or ballast from the tent support poles as determined by the manufacturer.
- Staking refers to the use of steel stakes/pins driven into the ground, either through a finished surface material (such as asphalt or concrete) or directly into earth.  
**Note:** Be aware of the soil conditions in the area where staking is to occur. Soil type and condition of the soil (wet/dry) will factor into the holding capacity of the stakes. Larger diameter stakes will result in increased holding capacity. Drive stakes/pins straight down as opposed to driving them in at an angle.
- Ballast refers to using concrete and water weight of various configurations.  
**Note:** Typical 50-55 gallon plastic water barrels are not recommended for ballast due to being top-heavy and they are prone to sliding on any surface. In addition, a typical 5 gallon bucket filled with concrete (approx. 100 lbs ea. when filled to the top) is not recommended. They are not consistent with volume or weight and are easily displaced.
- As a point of reference:
  - Standard concrete weights 150 lbs per cubic foot.
  - A gallon of water weighs 8.33 to 8.34 lbs. on average at 62°-70° F.

**Stake Sizing Table**

| Stake size | Average holding force- driven "full" depth                              |
|------------|-------------------------------------------------------------------------|
| 5/8" x 18" | 200 lbs                                                                 |
| 5/8" x 24" | 500 lbs                                                                 |
| 1" x 36"   | 1150 lbs                                                                |
| 1" X 42"   | 1450 lbs                                                                |
|            | <b>Note:</b> "Full" depth is considered to be within 1"-2" above grade. |
| Stake size | Average holding force- driven "½" depth                                 |
| 5/8" x 18" | 135 lbs                                                                 |
| 5/8" x 24" | 275 lbs                                                                 |
| 1" x 36"   | 400 lbs                                                                 |
| 1" x 42"   | 700 lbs                                                                 |

### Typical Ballast Weights (examples)

|                                   |                                         |                   |
|-----------------------------------|-----------------------------------------|-------------------|
| <b>Lego Style Concrete Block</b>  | 2 ft. wide x 3ft. long x 24 inches high | 1800 lbs          |
| <b>Cylindrical Concrete Block</b> | 24 inches diameter x 21 inches high     | 1000 lbs          |
| <b>Cylindrical Concrete Block</b> | 18 inches diameter x 18 inches high     | 500 lbs           |
| <b>Jersey Barrier (concrete)</b>  | 36 inches high x 10 ft. long            | 4000 lbs.         |
| <b>Jersey Barrier (water)</b>     | 36 inches high x 60 inches long         | 683 lbs. (filled) |
| <b>Giffy Tent Barrels (water)</b> | 75 gallon                               | 660 lbs. (filled) |

#### How to calculate number of stakes and/or how much ballast weight is needed:

- Multiply the square feet of the tent by 22.5 pounds per square foot (psf).
- For tent installations, it has been determined that 15 psf and a 1.5 safety factor is sufficient for most applications. (This equates to 22.5 psf)

#### Examples: (using 1 inch diameter by 36 inch long steel stakes/pins or 1000 lb. concrete ballast)

- 20' x 20' tent – 400 sq. ft.: 9000 lbs. = (9) stakes or (9) 1000 lb. (ea). concrete ballast.
- 30' x 60' tent- 1800 sq. ft.: 40,500 lbs. = (41) stakes or (41) 1000 lb. (ea). concrete ballast.
- 40' x 80' tent- 3200 sq. ft.: 72,000 lbs. = (71) stakes or (71) 1000lb. (ea). concrete ballast.
- 60' x 90' tent- 5400 sq. ft.: 121,500 lbs. = (122) stakes or (122) 1000 lb. (ea). concrete ballast.

#### Other items to consider:

- Age and labeled maximum working load (strength) of the ropes and/or straps to be used for anchoring purposes.
- Attach all ropes/straps as close to the ground as possible.
- Manufacturer Working Load rating labels to be permanently attached to straps.
- Multiple ropes of straps are allowed to be connected to singular ballasts, calculations will be based upon the lowest weight/strength combination. (For example, 3-500# labeled working load capacity straps attached to a singular 1800# ballast will be calculated at a maximum hold down capacity of 1500#. Similarly 3-750# labeled working capacity straps connected to a singular 1800# ballast will be calculated at a maximum hold down capacity of 1800#.)