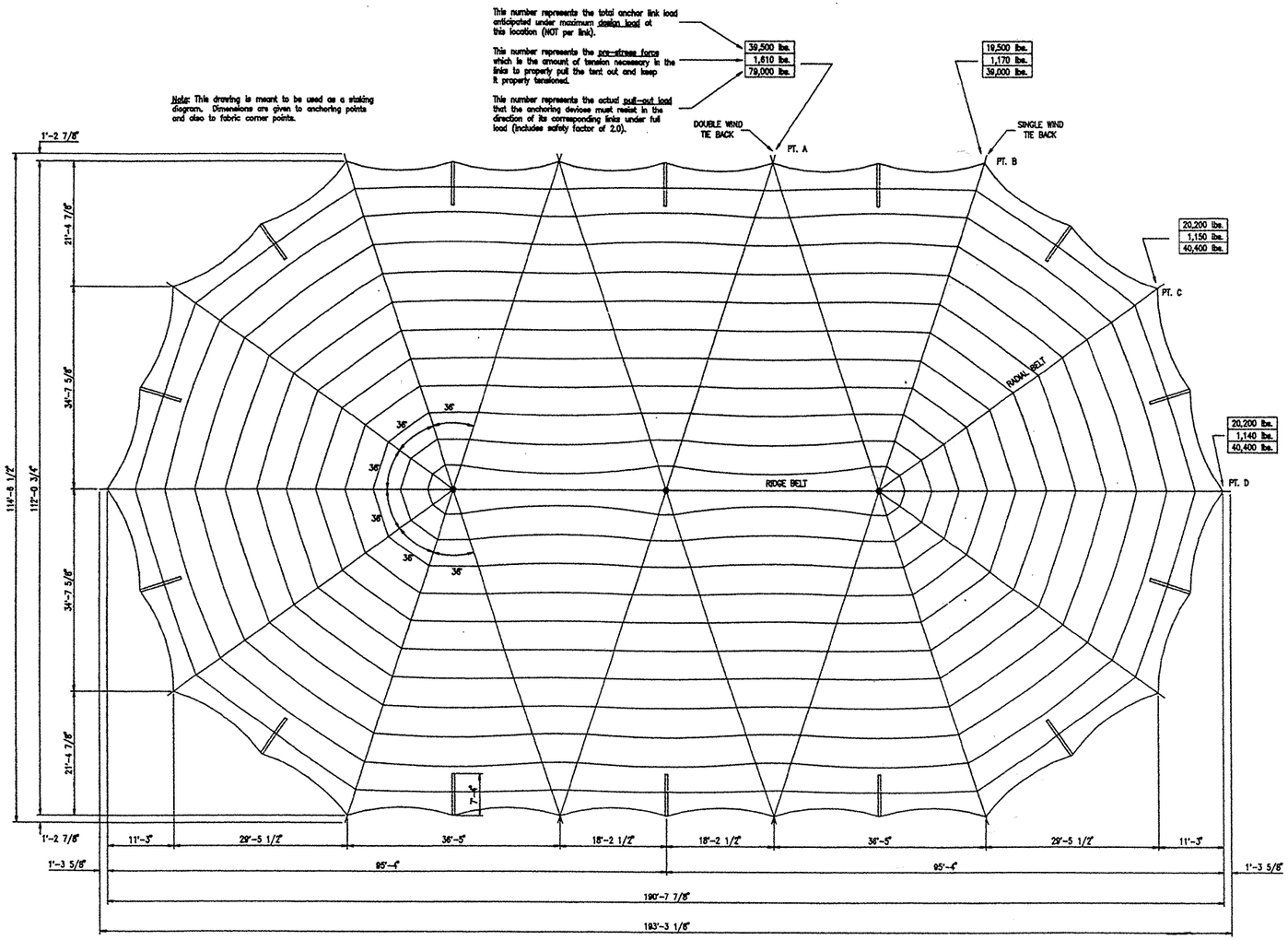
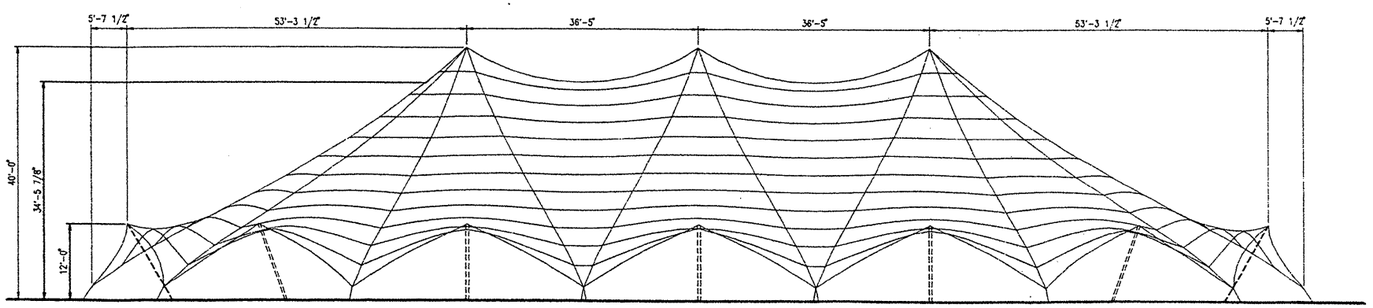
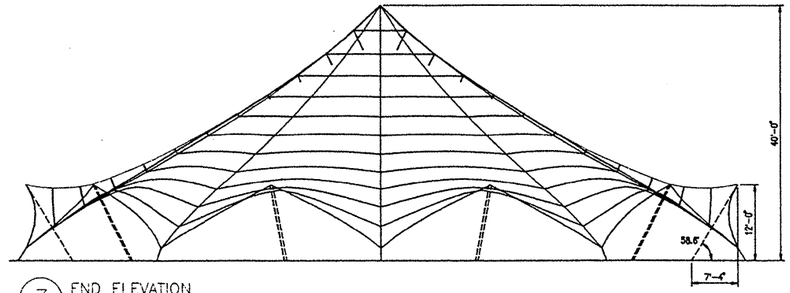


1 PLAN
3/32" = 1'-0"



2 FRONT ELEVATION
3/32" = 1'-0"



3 END ELEVATION
3/32" = 1'-0"

NOTES

GENERAL

The information on this drawing pertains only to the Armbruster 100' Wide Wind Version Tension Tent, a Future Tents® Design by Todd Dalland of FTL Associates, New York, manufactured exclusively by Armbruster Manufacturing Company, Springfield, Illinois. If used for review or approval of a particular Armbruster 100' Wide Wind Version Tension Tent application or installation, this FTL Associates drawing should be accompanied by the assurances of the manufacturer's engineer that the materials, sizes and specification requirements on this drawing will be met or exceeded, and by the assurances of the installer's engineer that the anchoring requirements and the installation and maintenance recommendations have been met or exceeded. The following criteria, resulting design loads, and typical material sizes are considered appropriate for many applications and installations of this standardized structure. The adequacy and appropriateness of the engineering criteria selected for the structure should be reviewed for each installation and site based on local climate wind conditions, geographical locations, exposure, duration of installation, occupancy, and building code requirements.

ENGINEERING CRITERIA

The engineering criteria selected for the Armbruster 100' wind Wind Version Tension Tent is as follows:

Design Wind Pressure: 20 psf.

Uniform Download: 5 psf.

(Structure is not engineered for snow loading)

Wind pressure coefficients used to calculate surface pressures have been derived from wind tunnel tests, performed on similar tent structures and from the ANSI code.

Although some allowance has been made for side opening, the analysis and design do not take into account the effect of a dominant opening on the wind-ward side during a storm.

The equilibrium surface form and load carrying behavior of this tent have been determined using computer programs for geometrically non-linear analysis involving finite elements and techniques of dynamic relaxation. Computer-aided structural analysis using Tensyl Formfinding and Analysis Software has been prepared by FTL Associates for two different wind directions for typical ease of uplift on the roof, and for a nominal downhill ease. All information pertains to structures mounted at grade on a horizontal ground plane.

INSTALLATION TIPS

1. All anchor locations must be laid out accurately as shown on the attached diagram (in advance of laying out the fabric) to a tolerance of ±6" in any direction (right or left, forward or back, up or down, etc.) All column base locations must be laid out accurately to a tolerance of ±3" in any direction.
2. Anchor and column locations shown on the diagram assume a perfectly flat site. If the actual site has variations in elevation that prevent all the anchors and column bases from being at the same level, new anchor locations and/or column lengths must be accurately calculated to preserve original design geometry and vectors.
3. Make sure that the anchors installed are adequate to resist the pull out loads shown on the diagram. Actual testing of some individual anchors to 75% of the anchor pull out load is recommended for seasonal installations and for earth anchors which are to be permanently installed for repeated use in one location. The installer is solely responsible for the evaluation of the site for the proper securing or anchoring methods to be used.
4. Make sure adequate tension to pull the fabric tight (pre-stress load) is applied to the guying cables before installation is complete. Pre-stress loads for each guy are shown on the diagram.
5. Measuring the angle of the masts and side poles offers a very good check on the geometrical accuracy of the installation. This can easily be done with an Angle-o-meter. As illustrated in this diagram, each and every sidepole should be inclined from front to back 58.6° above the horizontal ground plane. The center poles should be perpendicular to the horizontal ground plane.

Note: All the above considerations must be carefully met in order for the structure to obtain proper geometry, pre-stress, and anchor holding power, all of which are necessary to achieve full design load capability.

DERIVED STRUCTURAL FORCES

MATERIALS SIZES AND SPECIFICATIONS FOR THE ARMBRUSTER 100' WIDE WIND VERSION TENT

1) FABRIC:

Maximum Fabric Stress: 73 lb./in. Warp
73 lb./in. Fill

Recommended Safety Factor for Fabric: 4.0 times maximum design load (Federal Standard No. 191, Method 5102).

Use: Vinyl-laminated polyester fabric with a strip tensile strength (per Federal Standard No. 191, Method 5102) of:

73 x 4 = 292 lb./in. Warp
73 x 4 = 292 lb./in. Fill

Fabric to be top-coated to resist UV degradation and soiling.

FABRIC SEAMS:

A) Recommended Factor of Safety for fabric seams: 2.0 times the maximum design load (Federal Standard No. 191, Method 5102)

Use: Seam strength of 2 x 73 = 146 lb /in.

B) To pass a hanging "dead load seam test" of not less than four hours duration with no visible failure or slippage when subjected to a continuous load of 100% of the maximum design load at 90°F.

100% of maximum design load: 73 lb./in. Warp
73 lb /in Fill

2) WEBBING BELT REINFORCEMENTS:

RIDGE WEBBING BELTS:

Webbing belt ridge with greatest design load has been selected to size all ridge belts.

Webbing belt design load (tension): 22,800 lb.

Factor of Safety on polyester webbing belts: 4.0 times the maximum design load.

Use: Polyester webbing with minimum break strength of 91,200 lb. (with maximum elogation of 12% to 15% at break).

PERIMETER CATENARY WEBBING BELTS:

Perimeter catenary with greatest design load has been selected to size all catenary belts.

Webbing belt design load (tension): 7,400 lb

Factor of Safety on polyester webbing belts: 4.0 times the maximum design load.

Use: Polyester webbing with minimum break strength of 29,600 lb. (with maximum elongation of 12% to 15% at break).

Every webbing belt shall be individually terminated at each end fitting and sewn back onto itself for a distance 12 times as long as the belt is wide (i.e. for a 2" wide belt, the sew back length should be 24", for a doubled 2" wide belt the sew back distance should be 48").

Thread for stitching belts to fabric should be high quality UV resistant polyester. Thread and stitching on belt sew backs should be adequate to develop the full breaking strength of the belt.

Load carrying contribution of polyester fabric reinforcement bands which are effectively mechanically attached to the polyester webbing belt may be considered when sizing the belts to resist the above loads

3) COLUMNS

Center Poles:

Length: 40'-0"
Design Load: 41,000 lbs

Design using "Specifications for Aluminum Structures" published by the Aluminum Association of U.S.

Use: 12" nom. dia. schedule 40 aluminum pipe (6061-T6 alloy)

Side Poles:

Length: 14'-0"
Design Load: 10,900 lbs

Use: 5" nom. dia. schedule 40 aluminum pipe (6061-T6 alloy)

4) GUY CABLES

Point A Design Load: 39,500 lbs.

Point B Design Load: 19,500 lbs.

Point C Design Load: 20,200 lbs.

Point D Design Load: 20,200 lbs.

5) CONNECTING HARDWARE

All connecting hardware such as shackles, turnbuckles, pear-shaped rings, and fabricated plates or assemblies shall be rated or tested to 2.0 times the maximum design load of the vectors acting on the connectors under maximum design load.

INSPECTION

Each component of each Armbruster 100' wide Wind Version Tension Tent shall be inspected at the beginning and the end of each installation for visual signs of damage by the installer. All damaged materials shall be replaced immediately.

ANCHORING

A Factor of Safety of 2.0 times the design load is recommended for ground anchors for temporary structures.

A wide variety of ground anchoring devices are commonly used. Soil conditions and resulting ground anchor holding capacities vary from site to site, and can vary within a particular site. The Owner and/or installer of the Armbruster 100' Wide Wind Version Tension Tent is fully responsible for assuring that the selection and installation of the anchoring devices is adequate and appropriate to resist the pull-out loads on this drawing, for typical installations

Among other considerations, the Factor of Safety for the anchoring device has to do with the possibility of reduced anchor performance under wet soil conditions. Care should be taken that water is not allowed to drain or collect near anchors.

Anchoring device holding capacity can be developed using a single larger device, or by using multiple smaller devices.

INSTALLATION

Correct "pulling out" and "dressing out" of a rental tent requires diligence and considerable skill and expertise which can be obtained only through proper in-field training and experience on a professional rental tent Supervised Installation Crew which is instrumental to obtaining optimal structural behavior of the Armbruster 100' Wide Wind Version Tension Tent.

GENERAL GUIDELINES:

- Clear the site to prepare for the planned activity.
- Drop cloths can be used to prevent soiling or damage to the fabric membrane.
- Any objects with sharp projections which must remain on site under the tent should be padded and taped.
- Tent sections are placed on site, unrolled, and laced together, and secured to anchorages and attached to masts by hand.
- Before lift-up, all equipment is checked for operational condition.
- Perimeter attachments are connected to their anchors.
- Center poles are raised to their final position.
- Posts and guy ropes are then checked and methodically adjusted into final design geometry to obtain proper loading in the fabric. Any components showing visible signs of damage should be replaced immediately.
- Assembly instructions provided by the Armbruster Manufacturing Company should be followed to facilitate a more efficient and safer erection of the structure.

MAINTENANCE

Since a variety of materials and weather factors can result in fabric stretch, webbing belt stretch, rope stretch, mast foot settling, anchor settling, etc., changes to the design geometry of the tent, and consequently to the structural performance characteristics of the tent, can occur while the tent is unattended by the professional installer.

It is recommended that for many installations, a Maintenance Agreement be arranged between the Client and the Installer involving periodic inspections and adjustments.

All information and recommendations contained herein have been prepared by FTL Associates at the request of Armbruster Manufacturing and have been accepted and approved by Armbruster Manufacturing

ARMBRUSTER 100' WIDE
WIND VERSION TENSION TENT

no	date	revisions

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ARMBRUSTER
ESTABLISHED 1875
TENT MAKER
1-800-637-4326

CERTIFICATION DRAWING

job no	drawn by	approved by	drawing no
655			C2
scale: AS NOTED	date		